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Focused Recirculated Draft Environmental Impact Report/
Supplemental #2 Draft Environmental Impact Statement

September 1995

BART – SAN FRANCISCO AIRPORT EXTENSION

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**FOCUSED RECIRCULATED
FAST ENVIRONMENTAL IMPACT REPORT**

**SUPPLEMENTAL #2
FAST ENVIRONMENTAL IMPACT STATEMENT**

CISCO INTERNATIONAL AIRPORT EXTENSION

**NORTHERN SAN MATEO COUNTY
CALIFORNIA**

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION (FTA)**

**FRANCISCO BAY AREA RAPID TRANSIT DISTRICT (BART)
SAN MATEO COUNTY TRANSIT DISTRICT (SAMTRANS)**

**WITH COOPERATING AGENCIES:
U.S. ARMY CORPS OF ENGINEERS
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL AVIATION ADMINISTRATION**

PURSUANT TO:

of 1969, §102, 42 U.S.C. §4332(2)(c); National Historic Preservation Act of 1966, §106, et. as amended, §§(d), 3(i) & 14, 49 U.S.C. §§1602(d) and (i) and 1610; Title 49 U.S.C. §303 on Act of 1966, §4(f); and California Environmental Quality Act, California Public Resource

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D REF 387.7362 B281fr

BART-San Francisco
International Airport
1995.

Abstract

This Focused Recirculated Draft Environmental Impact Report/Supplemental #2 Draft Environmental Impact Statement (FRDEIR/S#2DEIS) has been prepared to evaluate aerial design options to the tunnel portion of Alternative VI (chosen as the Locally Preferred Alternative) for the BART–San Francisco Airport Extension project. These design options (known as the Alternative VI Aerial Design Option) provides east-west aerial access to the planned San Francisco Airport International Terminal and straight-through mainline service along the CalTrain right-of-way to a Millbrae Avenue BART/CalTrain Station.

Two different aerial station locations are proposed for the BART Airport International Terminal Station evaluated in this document. One is located inside the planned, new International Terminal (Option B) and one location is in front of the planned, new International Terminal (Option X). Both Options B and X include passenger convenience features that are consistent with Passenger Service Quality Standards for the BART airport station that were adopted by the BART Board of Directors and the San Francisco Airports Commission in September 1995. It is anticipated that any aerial BART airport station design considered for adoption will incorporate features that are most consistent with these Quality Standards. Accordingly, the Locally Preferred Alternative that is adopted could include features of Options B and X, that have been recently aired in the public forum, that are within the parameters described by Options B and X, and are consistent with the Quality Standards.

Because Options B and X would replace only a portion of the Locally Preferred Alternative, this document focuses only on the segment of Alternative VI south of Angus Avenue in San Bruno to the end of the tailtracks in Burlingame (referred to as Alternative VI Tunnel). The document addresses only significant new or different impacts due to the Alternative VI Aerial Design Option, compared to the Alternative VI Tunnel. The information resulting from the environmental studies as well as public and agency comments will be used by BART and SamTrans in selecting a project to be implemented and for BART, SamTrans, MTC, and FTA to make informed funding decisions.

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Comments on this document may be submitted in writing or may be made orally at a public hearing which has been scheduled on November 16, 1995.



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LIST OF KEY ACRONYMS

AA/DEIS/DEIR	Alternatives Analysis/Draft EIR/Draft EIS
ALRS	Airport Light Rail System
BART	San Francisco Bay Area Rapid Transit District
CalTrain	Peninsula Train Service operated by the PCJPB
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
DEIR/SDEIS	Draft EIR/Supplemental Draft EIS
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FEIR/FEIS	Final EIR/Final EIS
FTA	Federal Transit Administration (formerly UMTA)
GTC/RCG	Ground Transportation Center/Rental Car Garage
LPA	Locally Preferred Alternative
MTC	Metropolitan Transportation Commission
NEPA	National Environmental Policy Act
PCJPB	Peninsula Corridor Joint Powers Board
SamTrans	San Mateo County Transit District
SFIA	San Francisco International Airport
SPTCo	Southern Pacific Transportation Company
TSM	Transportation Systems Management
UMTA	Urban Mass Transportation Administration (now FTA)

EXECUTIVE SUMMARY

BART–San Francisco Airport Extension Focused Recirculated Draft Environmental Impact Report/ Supplemental #2 Draft Environmental Impact Statement

PURPOSE OF THIS REPORT

This *Focused Recirculated Draft Environmental Impact Report/Supplement #2 Draft Environmental Impact Statement* (FRDEIR/S#2DEIS) has been prepared to evaluate two design options to Alternative VI (chosen as the Locally Preferred Alternative [LPA]). The BART Board of Directors voted to pursue the evaluation of an aerial wye-stub with an airport station located at the planned International Terminal (Option B); and the San Francisco Airports Commission voted in support of an aerial wye-stub with an airport station located in front of the planned International Terminal (Option X). Because Options B and X would replace only a portion of the 1995 LPA, the new environmental analysis in this document focuses only on the segment of Alternative VI south of Angus Avenue in San Bruno to the end of the tailtracks in Burlingame.

DESCRIPTION OF THE ALTERNATIVE VI—LOCALLY PREFERRED ALTERNATIVE

On April 27 and 28, 1995, the BART and SamTrans Boards selected Alternative VI—BART to Millbrae via the Airport International Terminal as the new LPA. Alternative VI was selected because it 1) had the greatest community support; 2) would enhance regional mobility by providing the highest level of BART ridership, new transit ridership, and intermodal connections among BART, CalTrain, SamTrans, and the San Francisco International Airport (SFIA) Airport Light Rail System (ALRS); 3) was considered to be the Least Environmentally Damaging Practicable Alternative since it would result in the least impacts to wetlands and the habitat of threatened and endangered species; and 4) would connect directly with the airport.

The LPA route follows the San Bruno branch of the Southern Pacific Transportation Company (SPTCo) railroad between Colma and San Bruno, and then merges with the CalTrain mainline through downtown San Bruno. South of Angus Avenue in San Bruno, the BART subway alignment turns southeast under Highway 101 to the planned International Terminal at SFIA, and then turns southwest back under Highway 101 to the CalTrain mainline. The proposed extension terminates at a station at Millbrae Avenue in Millbrae with a tailtrack extending 1,500 feet into Burlingame. Stations would be provided at Hickey Boulevard, Tanforan Shopping Center, SFIA at the planned International Terminal, and a BART/CalTrain intermodal station at Millbrae Avenue. The LPA calls for subway between Colma and

South Spruce Avenue in South San Francisco; a retained cut alignment from South Spruce Avenue to San Bruno Avenue in San Bruno; a subway alignment through downtown San Bruno turning southeast to the planned Airport International Terminal and returning to the CalTrain mainline at Hillcrest Avenue in Millbrae; and an at-grade Millbrae Avenue Station with tailtracks extending south to Trousdale Avenue in Burlingame.

DESCRIPTION OF ALTERNATIVE VI AERIAL DESIGN OPTION

The BART and SamTrans Boards of Directors initiated study of alternative access routes into the airport, in accordance with BART's own recommendations and those of MTC, U.S. Congress and the San Francisco Airports Commission. The route, stations, and ancillary facilities are the same as those described for the LPA from the Colma tailtrack to Angus Avenue south of downtown San Bruno. The Aerial Design Option (a general term referring to the aerial wye-stub with either airport station location, B or X) differs from Alternative VI in the area referred to as the SFIA west of Bayshore parcel, at the SFIA, in the vicinity of the Millbrae Avenue Station, and along the tailtrack. In order to clarify comparisons between the Aerial Design Option and the LPA, this portion of the LPA is hereafter referred to as Alternative VI Tunnel.

Instead of the subway alignment through the SFIA west of Bayshore parcel to the planned Airport International Terminal under Alternative VI, the Aerial Design Option provides an east-west aerial guideway. Two optional locations have been proposed for the BART Airport International Terminal Station: Option B and Option X. Option B would locate the station platform at the International Terminal, 68 feet above grade, or one floor above the departure level. Option X would locate the station platform west of the International Terminal, 44 feet above grade or at the same elevation as the departure level. The Aerial Design Option also provides straight-through mainline service along the CalTrain right-of-way, bypassing the airport, to the Millbrae Avenue BART/CalTrain Station. This alignment would come up to grade just south of San Felipe Avenue, would run at grade through the west of Bayshore parcel to just north of Madrone Street in Millbrae, and continue in subway to the Millbrae Avenue Station.

The Millbrae Avenue Station has been revised since the selection of the LPA in response to the City of Millbrae's "Millbrae Avenue Station Area Concept Plan." There are three elements of the Area Concept Plan that are incorporated into this evaluation. These same station elements would apply to Alternative VI as design refinements to the 1995 LPA. Under the Aerial Design Option, the overall station footprint is slightly smaller (which would avoid acquisition of the gas station on Millbrae Avenue); the parking garage would be reoriented away from the Millbrae Avenue frontage (which would be consistent with the city's desire to stimulate economic opportunities in the area); and an additional exit route from the parking garage would be provided using Adrian Road (which would alleviate traffic congestion at the Millbrae/Rollins intersection in the P.M. peak hour).

South of Murchison Drive to the end of the tailtracks in Burlingame, BART would construct a sound wall along the western edge of the CalTrain right-of-way, screening uses along California Drive from BART and CalTrain.

Key features of the Aerial Design Option compared to other alternatives evaluated in the DEIR/SDEIS are presented in Table ES-1.

Table ES-1
Summary of BART Build Alternatives¹

1992 Locally Preferred Alternative	Alternative III Base Case Alternative	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae Intermodal	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Minimum Length Subway to Airport International Terminal (1995 LPA)	Alternative VII ² Aerial Design Option
Length (miles)	6.4	7.1	6.9	6.6	5.7	6.8	6.6 (B); 6.4 (X)
Number of Stations	3	4	3	3	2	4	4 • Colma to Millbrae: 1.3 (B), 1.1 (X)
Station Profile	• Hickey – subway • Tanforan – at grade • Airport Intermodal – at grade	• Hickey – subway • Tanforan – at grade, or Intermodal – aerial • Airport Long-Term Parking – aerial • Millbrae Intermodal – at grade	• Hickey – subway • Tanforan – at grade, or Intermodal – aerial • Downtown San Bruno – subway • Millbrae Intermodal – at grade	• Hickey – subway • 1-380/San Bruno or Downtown San Bruno – subway • Airport Ground Transportation Center – subway or aerial	• Hickey – subway • 1-380/San Bruno or Downtown San Bruno – subway • Airport Ground Transportation Center – subway or aerial	• Hickey – subway • Tanforan – retained cut • Airport International – subway • Millbrae Ave. – at grade	• Colma to SFOA – 6.6 (B); 6.4 (X) • Colma to Millbrae: 7.5 • SFOA to Millbrae: 1.3 (B), 1.1 (X)
Parking Spaces	• Hickey – 1,337 • Tanforan – 650 • Airport Intermodal – 2,325 Total: 4,312	• Chestnut – 1,100 • Tanforan – 650 • Airport Intermodal – 2,325 Total: 4,075	• Hickey – 1,337 • Tanforan – 1,300, 1-380 – 1,500 • Airport Long-Term Parking – 100 • Millbrae Intermodal – 1,500 Total: 4,237-4,437	• Hickey – 1,337 • Tanforan – 1,300, 1-380 or Downtown San Bruno – 1,500 • Airport Ground Transportation Center – 0 Total: 4,337	• Hickey – 1,337 • 1-380 or Downtown San Bruno – 3,000 Total: 4,337	• Hickey – 1,337 • Tanforan – 1,000 • Airport International Terminal – 0 • Millbrae Ave. – 3,000 Total: 5,337	• same as Alternative VI
Intermodal Connections	• Airport Intermodal- CalTrain/ALRS • All Stations – SanTrans	• Airport Intermodal – CalTrain/ALRS • All Stations – SanTrans	• 1-380 or Downtown San Bruno – CalTrain • Millbrae – CalTrain/ALRS • All Stations – SanTrans	• 1-380 or Downtown San Bruno – CalTrain/ALRS • All Stations – SanTrans • Transportation Center – ALRS • All Stations – SanTrans	• 1-380 or Downtown San Bruno – CalTrain/ALRS • All Stations – SanTrans	• Millbrae Ave. – CalTrain • Airport International Terminal – ALRS • All Stations – SanTrans	• same as Alternative VI
Daily Patronage Volume (in 1995)	53,100	53,000	54,800	56,100	53,200	63,000 ³	62,100 (B); 62,600 (X)
Capital Costs (BART in thousands 1995)	\$1,002,370	\$876,442	\$1,080,325	\$902,221	\$803,215	\$1,269,234	\$1,074,251 (B); \$1,096,235 (X)
Operating and Maintenance Costs ² (systemwide with extension – millions of 1995\$)	\$304.4	\$304.0	\$307.9	\$306.4	\$305.4	\$309.1	\$308.3 (B); \$308.2 (X)

Source: BART
1. Alternatives not presented here are the No-Build Alternative and the Transportation Systems Management Alternative.
2. Extension for the airport replacement station from Colma to Burlingame.
3. This figure is not reported in 60,700 in the DEIR/SEIS because of a typographical error.
ALRS = Airport Light Rail System

FOCUS OF THIS ENVIRONMENTAL DOCUMENT

This FRDEIR/S#2DEIS evaluates two design options to Alternative VI. Because new options have been proposed for bringing BART service to the SFIA, the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) require that their environmental consequences be analyzed and disclosed to the public. To satisfy this mandate to present analyses of the new options, this document is a "recirculation" of the DEIR prepared pursuant to CEQA and a supplement to the DEIS prepared pursuant to NEPA. (This document is a second supplement to the DEIS in that it supplements both the AA/DEIS/DEIR and the DEIR/SDEIS.) Because Options B and X modify only a segment of the Alternative VI LPA, CEQA and NEPA allow the new environmental analyses to focus only on the differences between the options and Alternative VI. Accordingly, this document concentrates on effects of the aerial wye-stub to the airport, the mainline paralleling CalTrain between the Armory in San Bruno and the Millbrae Avenue Station, and tailtracks in Millbrae and Burlingame. In all other aspects the Alternative VI Aerial Design Option is identical to the Alternative VI LPA. Consequently, this FRDEIR/S#2DEIS does not evaluate the segment of the LPA alignment between Colma and Angus Avenue in San Bruno.

The 1989 *San Francisco International Airport Final Draft Master Plan* outlines a number of infrastructure improvements to be implemented by the year 2006 to accommodate projected growth at the airport. Key improvements that would interface either with the construction or operation of the Aerial Design Option, east of the western edge of Highway 101, include the construction of an International Terminal, the Ground Transportation Center/Rental Car Garage, an ALRS, and new highway ramps into and out of the airport.

IMPACTS SPECIFIC TO THE ALTERNATIVE VI DESIGN OPTION

Impacts of the Aerial Design Option are in many ways comparable to those identified under Alternative VI Tunnel. The differences occur primarily in areas where the route and station layout have been modified from Alternative VI Tunnel. The following discussion highlights the significant impacts of the Aerial Design Option that differ from those identified for Alternative VI Tunnel; impacts are the same unless otherwise noted. Specifically, additional significant impacts beyond those identified for Alternative VI do not occur for transportation, cultural resources, community services and facilities, geology, air quality, public health and safety, and energy. Significant impacts which would occur only under the Aerial Design Option are bulleted below; unavoidable adverse impacts (i.e., those significant adverse impacts that cannot be mitigated to an insignificant level) are italicized.

Long-Term Effects

All impacts below, except those in italics, can be mitigated to an insignificant level with implementation of the mitigation measures proposed in Chapter 3 of this document.

Land Use

- The number of displaced employees would be less under the Aerial Design Option, because a change in the station footprint would preserve a gas station along Millbrae Avenue that would be acquired under Alternative VI.

Visual Quality

- *The elevated guideways of the wye-stub north and south legs would alter the visual setting and detract from the SFIA property west of Bayshore as a scenic open space resource. The guideways would appear out of context with the undeveloped, natural setting and would obstruct views of this area and San Bruno Mountain from residences along Madrone Street in the Marino Vista neighborhood in Millbrae.*

Geology, Soils and Seismicity

- The aerial wye-stub and Airport International Terminal Station would be subject to strong groundshaking due to locally active faults.

Biological Resources

- Approximately 0.97 acres of wetland habitat would be affected by the BART tracks and facilities along the CalTrain mainline.
- The mainline tracks would result in the displacement and/or loss of approximately 9.87 acres of wetland and upland habitat for the endangered San Francisco Garter Snake (SFGS). Approximately 0.85 acres of the 9.87 acres are wetland habitats that support the SFGS, the California red-legged frog, and the San Francisco forktail damselfly.
- The aerial track alignment would require the placement of column structures within the wetlands on the west of Bayshore parcel. This action would permanently displace approximately 0.04 acres of wetland habitats.
- The aerial stub into the SFIA would result in the displacement and/or loss of approximately 0.59 acres of wetland and upland habitats for the endangered SFGS. Approximately 0.04 acres of the 0.59 acres are wetland habitats that support the SFGS, the California red-legged frog, and the San Francisco forktail damselfly.

Noise and Vibration

San Bruno

- Airborne noise from the at-grade BART segment along the CalTrain right-of-way would exceed the 75 dBA significance criterion, affecting homes along San Antonio Avenue at the second floor level through this stretch of the proposed alignment.
- Airborne noise from train passbys over the aerial wye-stub would affect 16 to 20 homes in the Lomita Park neighborhood.

Millbrae

- The Lomita Park Elementary School would be exposed to airborne noise impacts in excess of the 75 dBA criterion caused by train passbys on the southern leg of the aerial wye-stub.
- Airborne noise and groundborne vibration from the Aerial Design Option mainline would affect residents in the Airport Park neighborhood.
- Groundborne noise and vibration impacts exceeding applicable standards (35 dBA for noise, 75 dBA for vibration) would occur near crossovers in the Marino Vista, Millbrae Manor, and Bayside Manor neighborhoods.

SFIA

- The United Airlines administration building would experience airborne noise impacts above the identified criterion under both Option B and X.

Short-Term Effects

All impacts listed below, except those in italics, can be mitigated to an insignificant level with implementation of the mitigation measures proposed in Chapter 3, Section 13, of this document.

Land Use

- The selection of laydown yard Alternative A would displace the community garden, south of Lion's Field Park.
- Construction activities at any of the optional laydown yards and staging areas proposed for San Bruno and associated truck traffic would disturb residents of the Belle Air neighborhood in San Bruno.
- Construction activities at the Millbrae Avenue Station yard and associated truck traffic would disturb residents of Millbrae.

Visual Quality

- *Construction of the sound wall along the at-grade portion of the BART mainline would adversely affect close-up views and create a sense of encroachment and loss of privacy for residents along Huntington and San Antonio Avenues in San Bruno and along Landing Lane in Millbrae.*
- *The SFIA property west of Highway 101 would be temporarily altered by construction activities for the aerial alignment and mainline tracks; these activities would detract from views of this area and of San Bruno Mountain from both San Bruno and Millbrae neighborhoods.*

Biological Resources

- Geotechnical field investigations for the mainline and aerial portions of the alignment would temporarily disturb approximately 0.18 and 0.09 acres, respectively, of habitat on or in the immediate vicinity of the west of Bayshore parcel.
- The clearing of vegetation within the construction easement and in the Alternative B or C storage yard and staging area would eliminate important cover habitat for the endangered SFGS and habitat for nesting bird species.
- Construction of the mainline would disturb all biotic resources within the proposed construction right-of-way, including approximately 0.70 and 1.50 acres of wetlands (depending upon which storage yard and staging area alternative is selected).
- Construction of the mainline and aerial portions of the alignment would disturb endangered species habitat and may result in the loss of individual SFGS.
- Relocation of PG&E transmission lines would result in disturbances to biotic resources on the west of Bayshore parcel.
- Construction of the aerial guideways over the west of Bayshore parcel would disturb approximately 0.06 to 0.98 acres of wetlands, depending on which storage yard and staging area alternative were selected and on the type of temporary construction road used at the site.

Noise and Vibration

- Truck traffic associated with laydown yard Alternative A and possibly Alternative C would result in significant short-term noise impacts for residents along 1st Street in San Bruno.
- Construction of the subway structure and truck traffic would generate excessive noise levels for residents in the Millbrae neighborhoods adjacent to the CalTrain right-of-way.
- If impact or vibratory pile driving is necessary for construction of the aerial wye-stub to the SFIA or the Millbrae Avenue Station, significant noise and vibration impacts from unshielded pile drivers could affect wildlife and sensitive receptors along San Antonio Avenue and in the vicinity of the Millbrae Avenue Station.

Air Quality

- *During construction activities, emissions of particulate matter (PM₁₀) would exceed identified thresholds.*

Energy

- *A maximum of 851.2 billion Btu per year of nonrenewable energy would be required during construction.*

The preceding list of impacts, which is specific to the Alternative VI Aerial Design Option, provides a basis for comparison between Alternative VI Tunnel and Options B and X. Table ES-2 at the end of this section compares the Aerial Design Option and the other alternatives identified for bringing BART service to the SFIA. This table provides an overview by identifying the key impacts of each alternative. It should be noted that Table ES-2 compares the effects of each alternative/design option for the *entire* project corridor from the Colma tailtracks to the Burlingame tailtracks. By contrast, the preceding list of significant effects, as well as much of the discussion in this document, concentrates on presenting the differences between the Aerial Design Option and Alternative VI Tunnel.

ENVIRONMENTAL BENEFITS OF THE AERIAL DESIGN OPTION

The Aerial Design option has environmental benefits which Alternative VI Tunnel does not have. The following list identifies significant unavoidable impacts that would occur under Alternative VI Tunnel but *not* under the Aerial Design Option.

Long-Term Effects

Noise and Vibration

- Twelve single family residences on Aviator Avenue in Millbrae would experience groundborne vibration levels in excess of the appropriate criterion.
- Two single family homes on Aviator Avenue would experience airborne noise and groundborne vibration impacts in excess of appropriate criteria.
- Seven to eight homes on Santa Paula in Millbrae would experience groundborne noise in excess of the appropriate criterion.

Short-Term Effects

Land Use

- Partial displacement of Lion's Field Park would occur if it is used as a contractor laydown area.

Visual Quality

- Construction of the tunnel portal entrance on SFIA property south of Cupid Row Canal and the surrounding 17-acre staging area would alter the visual setting along Huntington and San Antonio Avenues in San Bruno and detract from the open space quality of the area west of Highway 101.

AREAS OF CONTROVERSY

The areas of controversy that have been identified at BART, SamTrans, and San Francisco Airports Commission meetings for the Alternative VI Aerial Design Option include concerns regarding impacts to CalTrain connectivity and biological issues. These are summarized below.

- **CalTrain Connectivity.** Impacts to the approximately 10 percent of rail patrons to SFIA who will need to transfer to BART at the Millbrae Avenue Station and to the ALRS on airport property.
- **Biological Issues.** Need for mitigation on the SFIA property west of Highway 101 to reduce impacts to the habitat of the SFGS from construction of the BART facilities.

ISSUES TO BE RESOLVED

The following critical decisions must be made prior to the implementation of the BART–San Francisco Airport Extension:

- selection of a project alignment;
- determination of federal and SFIA funding contributions; and
- selection and adoption of appropriate mitigation measures.

Table ES-2
Comparison of Key Impacts

Issue	Proposed Project (1992 LPA)	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal (1995 LPA)	Alternative VI Aerial Design Option*
Transit Ridership											
• Increase in Daily Regional Ridership (passengers) compared to No Build in 1998	• 35,800	• Same as proposed project	• N/A	• 2,100	• 36,100	• 36,100	• 36,500	• 35,700	• 35,900	• 38,400	• 37,600
• Daily BART Patronage in San Mateo County in 1998 (entrances and exits)	• 80,700	• Same as proposed project	• 45,500	• 41,900	• 81,000	• 82,800	• 84,100	• 81,100	• 80,900	• 91,000 ¹	• 90,100 (B) 90,000 (X)
Traffic											
• Freeways (compared to 1993 No Build conditions)	<ul style="list-style-type: none">• Reduces regional congestion.• <u>Reduces Highway 101 level of service between SFIA and Millbrae and between Millbrae and Broadway and between Poplar and Third Avenues to unacceptable levels in 1998 and 2010.</u>• <u>Reduces Highway 101 level of service between Broadway and Poplar to unacceptable levels in 2010.</u>• <u>Exacerbates already unacceptable level of service on Highway 101 between Broadway and Poplar Avenue in 1998.</u>• Reduces Highway 101 weaving section between SFIA and Millbrae Avenue in 1998 and 2010.• <u>Reduces Highway 101 weaving section between San Bruno Avenue and SFIA and between SFIA and Millbrae Avenue to unacceptable levels in 1998 and 2010.</u>	• Same as proposed project.	<ul style="list-style-type: none">• <u>Reduces Highway 101 level of service between Millbrae and Broadway and between Poplar and Third Avenues to unacceptable levels in 1998 and 2010.</u>• <u>Reduces Highway 101 level of service between SFIA and Millbrae and between Broadway and Poplar Avenue to unacceptable levels in 2010.</u>• <u>Reduces Highway 101 weaving section between San Bruno Avenue and SFIA and between SFIA and Millbrae Avenue to unacceptable levels in 1998 and 2010.</u>	<ul style="list-style-type: none">• Reduces regional congestion.• <u>Reduces Highway 101 level of service between Millbrae and Broadway and between Poplar and Third Avenue to unacceptable levels in 1998 and 2010.</u>• <u>Reduces Highway 101 level of service between Broadway and Poplar to unacceptable levels in 2010.</u>• Reduces Highway 101 weaving section between SFIA and Millbrae Avenue to unacceptable levels in 1998 and 2010.• <u>Reduces Highway 101 weaving section between San Bruno and SFIA to unacceptable levels in 2010.</u>	<ul style="list-style-type: none">• Reduces regional congestion.• <u>Reduces Highway 101 level of service between SFIA and Millbrae and between Millbrae and Broadway and between Poplar and Third to unacceptable levels in 1998 and 2010.</u>• <u>Reduces Highway 101 level of service between Broadway and Poplar to unacceptable levels in 2010.</u>• <u>Exacerbates already unacceptable level of service on Highway 101 between Broadway and Poplar Avenue in 1998.</u>• <u>Reduces Highway 101 weaving section between San Bruno and SFIA to unacceptable levels in 1998 and 2010.</u>• Reduces Highway 101 weaving section between SFIA and Millbrae Avenue in 1998 and 2010.	<ul style="list-style-type: none">• Same as Alternative III except• Improves Highway 101 weaving operations between San Bruno and SFIA in 1998.• <u>Reduces Highway weaving section between San Bruno and SFIA to unacceptable levels in 2010.</u>	<ul style="list-style-type: none">• Reduces regional congestion.• <u>Reduces Highway 101 level of service between SFIA and Millbrae and between Millbrae and Broadway and between Poplar and Third Avenue and to unacceptable levels in 1998 and 2010.</u>• Reduces Highway 101 weaving section between SFIA and Millbrae Avenue in 1998 and 2010.• Improves Highway 101 weaving operations between San Bruno and SFIA in 1998.• <u>Reduces Highway weaving section between San Bruno and SFIA to unacceptable levels in 2010.</u>	<ul style="list-style-type: none">• Reduces regional congestion.• <u>Reduces Highway 101 level of service between SFIA and Millbrae and between Millbrae and Broadway to unacceptable levels in 1998 and 2010.</u>• <u>Reduces Highway 101 level of service between Broadway and Poplar and between Poplar and Third to unacceptable levels in 2010.</u>• <u>Reduces Highway 101 weaving section between San Bruno Avenue and SFIA in 1998 and 2010.</u>• <u>Exacerbates already unacceptable level of service on Highway 101 between Broadway and Poplar and between Poplar and Third Avenue in 1998.</u>• Reduces Highway 101 weaving section between SFIA and Millbrae Avenue in 1998 and 2010.	• Same as Design Option V-A.	<ul style="list-style-type: none">• Reduces regional congestion.• <u>Reduces Highway 101 level of service between Millbrae and Broadway and between Broadway and Poplar and between Poplar and Third Avenue to unacceptable levels in 1998 and 2010.</u>• <u>Reduces Highway 101 level of service between SFIA and Millbrae to unacceptable levels in 2010.</u>• Reduces Highway 101 weaving operations between SFIA and Millbrae in 2010.	• Same as Alternative VI.

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* The impacts presented for the Alternative VI Aerial Design Option are for the entire project corridor, not just for the Aerial Design Option study area.
1 This figure has been revised from 88,300 in the DEIR/SDEIS.

Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option*
Local Intersections (Compared to 1993 No Build conditions)	Significant deterioration in LOS at Hickey extension/station exit in PM, El Camino Real/Sneath in PM, and Chestnut/Grand in PM.	Same as proposed project.	Significant deterioration in LOS at Chestnut/Grand, El Camino Real/Westborough, El Camino Real/Sneath, and California/Broadway.	Generally same or improved LOS at local intersections.	Significant deterioration in LOS at El Camino Real/Sneath. Exacerbates already unacceptable levels of service at Junipero Serra/Westborough.	Significant deterioration in LOS at the Hickey extension/station exit in PM, Chestnut/Grand in PM and San Mateo/Huntington and San Anselmo/Center in PM. If Tanforan Station option were selected, reduced LOS at El Camino Real/Sneath.	Same as Alternative IV plus For the Downtown San Bruno Station option, impacts would be the same as those identified for the I-380/San Bruno Station except that San Mateo/Angus would also be significantly affected.	Significant deterioration in LOS at San Mateo/Huntington in PM, San Mateo/Lumber Yard Kiss-and-Ride exit in PM, the Hickey extension/station exit and Chestnut/Grand, in PM.	Same as Design Option V-A.	Significant deterioration in LOS at Hickey extension/station exit and Chestnut/Grand in PM; El Camino Real/Sneath, Huntington/Tanforan Driveway North in PM, and El Camino Real/Millbrae in AM.	Same as Alternative VI.
Parking in 2010	Reduction in parking demand of Daly City and Colma Stations. Demand exceeds design at Daly City and Tanforan Stations. Spillover parking into neighborhoods at Hickey and into Tanforan Shopping Center. SFIA air passengers may park at the Airport Intermodal Station to access ALRS.	Same as proposed project.	Demand exceeds design at Daly City and Colma Stations.	Same as No Build Alternative.	Reduction in parking demand at Daly City and Colma Stations. Demand exceeds design at Daly City, Chestnut, and Tanforan Stations. Spillover parking into neighborhoods at Chestnut Station, the Airport Intermodal Station, and into Tanforan Shopping Center. SFIA air passengers may park at the Airport Intermodal Station to access ALRS.	Reduction in parking demand at Daly City and Colma Stations. Demand exceeds design at Daly City Station. Spillover parking into neighborhoods at Hickey, I-380/San Bruno, and Millbrae Intermodal Stations, and into Tanforan Shopping Center. SFIA air passengers may park at the Millbrae Intermodal Station to access ALRS.	Reduction in parking demand at Daly City and Colma Stations. Demand exceeds design at Daly City and Millbrae Intermodal Stations. Spillover parking same as Alternative IV. SFIA air passengers may park at the Millbrae Intermodal Station to access ALRS.	Reduction in parking demand at Daly City and Colma Stations. Demand exceeds design at Daly City Station. Spillover parking into neighborhoods at Hickey, I-380/San Bruno or Downtown San Bruno stations. SFIA air passengers may park at I-380/San Bruno or Downtown San Bruno Stations to access ALRS.	Same as Design Option V-A.	Same as Design Option V-A, but with spillover parking at San Bruno and Millbrae Avenue Stations.	Same as Alternative VI.
Land Use	General Plan Consistency	Generally consistent with San Bruno Plan.	Conflicts with San Bruno Plan.	No effect.	No effect.	Conflicts with Colma, South San Francisco, and San Bruno Plans.	Conflicts with San Bruno and Millbrae Plans.	Conflicts with San Bruno and Millbrae Plans.	Conflicts with San Bruno Plan.	Conflicts with San Bruno Plan.	Generally consistent with San Bruno Plan but conflicts with Millbrae Plan. Generally consistent with San Bruno Plan and with Millbrae's Station Area Concept Plan. Option B requires greater changes in SFIA Master Plan projects than Option X.
Displacement	120 residents; up to 130 employees.	Same as proposed project.	No displacement.	No or little displacement.	No residential displacement; up to 40 employees.	Up to 560 residents; up to 490 employees.	Up to 600 residents; up to 605 employees.	Up to 650 residents; up to 565 employees.	Same as Design Option V-A.	Up to 525 residents; up to 60 employees.	Up to 525 residents; up to 55 employees.

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Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option*
Land Use (continued)											
• Community Cohesion/Local Economic Activity in Station Vicinity	<ul style="list-style-type: none">Minimally affects real estate or economic development <i>except</i>At Hickey where it supports local development objectives.<u>Displacement at Hickey Station disrupts local social patterns of shopping, circulation, and neighborhood activities.</u>Displacement of Tanforan Shopping Center overflow parking for Tanforan Station may affect economic development.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">No effect.	<ul style="list-style-type: none">Minimally affects real estate at the CalTrain/Airport Light Rail Station.	<ul style="list-style-type: none">Conflicts with residential development objectives in South San Francisco.Displacement of Tanforan Shopping Center overflow parking for Tanforan Station may affect economic development.Chestnut Station displaces 18-stall golf driving range and bar/cafe.Displaces businesses around Chestnut Station.	<ul style="list-style-type: none"><u>Displacement at Hickey Station disrupts local social patterns of shopping, circulation, and neighborhood activities.</u>Displacement of Tanforan Shopping Center overflow parking for Tanforan Station may affect economic development.<u>Loss of municipal and school tax revenues in San Bruno with I-380 Station option.</u><u>Economic / isolation impacts in Millbrae.</u><u>Loss of the Millbrae Nursery School and Marino Vista Park.</u>	<ul style="list-style-type: none"><u>Displacement at Hickey Station disrupts local social patterns of shopping, circulation, and neighborhood activities.</u>Displacement of Tanforan Shopping Center overflow parking for Tanforan Station may affect economic development.<u>Loss of municipal and school tax revenues in San Bruno, with either I-380 or Downtown San Bruno Station.</u><u>Disrupts the San Bruno Central Business District.</u><u>I-380/ San Bruno Station affects Belle Air and San Bruno Park neighborhoods.</u><u>Loss of Posy Park with Downtown San Bruno Station.</u><u>Economic / isolation effects in Millbrae.</u><u>Loss of the Millbrae Nursery School and Marino Vista Park.</u>	<ul style="list-style-type: none"><u>Same as Alternative V except</u><u>Impact in San Bruno would be greater due to larger station; ALRS would further fragment Belle Air neighborhood</u> <i>plus</i>There would be no impacts at the Tanforan or Millbrae Intermodal Stations.	<ul style="list-style-type: none"><u>Same as Design Option V-A</u>	<ul style="list-style-type: none"><u>Displacement at Hickey Station disrupts local social patterns of shopping, circulation, and neighborhood activities.</u><u>Loss of municipal and school tax revenues in San Bruno and Millbrae.</u><u>Requires relocation of Millbrae Gardens.</u>	<ul style="list-style-type: none">Same as Alternative VI.
• Community Cohesion/Social Considerations (Not in Station Vicinity but along Alignment)	<ul style="list-style-type: none"><u>Fragments Fifth Addition.</u><u>Impacts Belle Air neighborhood.</u>Reduces supply of low-cost housing in San Bruno and San Mateo County.	<ul style="list-style-type: none"><u>Fragments Fifth Addition more than proposed project because of aerial configuration.</u><u>Impacts Belle Air Elementary School and 7th and Walnut Park.</u>	<ul style="list-style-type: none">No neighborhood impacts.	<ul style="list-style-type: none">No BART-related neighborhood impacts.Increased activity along CalTrain right-of-way would impact South San Francisco, San Bruno, and Millbrae, and along the Hickey Boulevard extension in South San Francisco.	<ul style="list-style-type: none"><u>Introduces land use incompatibility with cemeteries in Colma.</u><u>Introduces physical barrier in South San Francisco and San Bruno.</u>Displaces approximately 400 spaces of municipal, private, and CalTrain parking.	<ul style="list-style-type: none"><u>Introduces physical barrier in Belle Air neighborhood.</u><u>Impacts Belle Air neighborhood in San Bruno and Marino Vista and North Millbrae neighborhoods in Millbrae.</u>Reduces supply of low-cost housing in San Bruno and San Mateo County.	<ul style="list-style-type: none"><u>Impacts Belle Air neighborhood in San Bruno and Marino Vista and North Millbrae neighborhoods in Millbrae.</u>Reduces supply of low-cost housing in San Bruno and San Mateo County.	<ul style="list-style-type: none">Same as Alternative V.	<ul style="list-style-type: none">Same as Alternative V.	<ul style="list-style-type: none"><u>Impacts Fifth Addition neighborhood in San Bruno.</u>Reduces supply of low-cost housing in San Bruno and San Mateo County.	<ul style="list-style-type: none">Same as Alternative VI.
• Regional Economic Activity	<ul style="list-style-type: none">Creates 675 to 1,125 direct/indirect jobs.	<ul style="list-style-type: none">Same as proposed project	<ul style="list-style-type: none">Creates few jobs.	<ul style="list-style-type: none">Creates fewer jobs than proposed project.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">Same as proposed project.	<ul style="list-style-type: none">Same as Alternative VI.

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Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option*
Visual Quality											
Built Environment	<ul style="list-style-type: none"> <u>ALRS and Highway 101 connections introduce scale incompatibilities in Millbrae.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project plus Scale incompatibilities would occur in Fifth Addition neighborhood in San Bruno.</u> 	<ul style="list-style-type: none"> No effect. 	<ul style="list-style-type: none"> Same as proposed project. 	<ul style="list-style-type: none"> <u>Same as proposed project plus Aerial BART alignment introduces scale incompatibilities in San Bruno.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project plus Aerial BART alignment and station options introduce scale incompatibilities in the Belle Air neighborhood of San Bruno.</u> <u>Millbrae Intermodal Station, ALRS, and Highway 101 connections introduce scale incompatibilities in Marino Vista and North Millbrae neighborhoods in Millbrae.</u> 	<ul style="list-style-type: none"> <u>Same as Alternative IV plus BART parking structure introduces scale incompatibilities with homes on east side of 3rd Avenue in San Bruno.</u> 	<ul style="list-style-type: none"> <u>Same as Alternative V except No effects in Millbrae. BART parking structure introduces scale incompatibilities with homes on east side of 3rd Avenue in San Bruno.</u> 	<ul style="list-style-type: none"> <u>Same as Design Option V-A.</u> 	<ul style="list-style-type: none"> <u>BART facilities introduce scale incompatibilities in Millbrae.</u> <u>Tanforan Station would introduce scale incompatibilities in San Bruno.</u> 	<ul style="list-style-type: none"> Same as Alternative VI.
Scenic Resources and Significant Views	<ul style="list-style-type: none"> <u>Temporary removal of mature trees within Colma and South San Francisco.</u> Storage tracks and car wash affect views and scenic resources in Millbrae. <u>ALRS and Highway 101 ramps obstruct views of San Bruno Mountain and diminish appeal of SFIA open space area west of Highway 101.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project.</u> 	<ul style="list-style-type: none"> No effect. 	<ul style="list-style-type: none"> <u>ALRS and Highway 101 ramps obstruct view of San Bruno Mountain from Millbrae and diminish appeal of SFIA open space area west of Highway 101.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project except Permanent removal of trees in Colma cemeteries.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project plus Aerial configuration and Millbrae Intermodal Station significantly affects view of San Bruno Mountain.</u> No effect from storage tracks or car wash. 	<ul style="list-style-type: none"> <u>Same as proposed project but greater effect on views of San Bruno Mountain because of Millbrae Intermodal Station.</u> No effect from storage tracks or car wash. 	<ul style="list-style-type: none"> <u>Same as proposed project except No effects in Millbrae.</u> 	<ul style="list-style-type: none"> <u>Same as Design Option V-A.</u> 	<ul style="list-style-type: none"> <u>Temporary removal of mature trees within Colma and South San Francisco.</u> 	<ul style="list-style-type: none"> Same as Alternative VI. <u>Aerial guideways across SFIA property west of Highway 101 contrasts with undeveloped, natural setting and obstructs views of San Bruno Mountain from Madrone Street in the Marino Vista neighborhood.</u>
Sensitive Receptors	<ul style="list-style-type: none"> <u>Daly City Shop/Yard sound wall creates perception of encroachment for Meadowbrook Trailer Park residents.</u> Tanforan Station facilities and alignment may create a sense of encroachment for San Bruno residents. 	<ul style="list-style-type: none"> <u>Same as proposed project plus I-380 aerial segment creates encroachment for homes in San Bruno's Fifth Addition neighborhood.</u> 	<ul style="list-style-type: none"> No effect. 	<ul style="list-style-type: none"> No effect. 	<ul style="list-style-type: none"> <u>Same as proposed project plus Retained cut effects cemeteries in Colma and residents in South San Francisco.</u> The Chestnut Station parking structure would introduce light and glare into South San Francisco. <u>Ancillary facilities, a retaining wall, and fencing create a sense of encroachment in South San Francisco.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project plus Encroachment effects by San Bruno Station options and Millbrae Intermodal Station.</u> The I-380/San Bruno Station would introduce light and glare in San Bruno. BART storage tailtrack would extend to within 60 feet of sensitive receptors in Millbrae. 	<ul style="list-style-type: none"> Same as Alternative IV except Light and glare effects at Downtown San Bruno Station instead of I-380 Station. 	<ul style="list-style-type: none"> Same as Alternative V except No effects in Millbrae. 	<ul style="list-style-type: none"> <u>Same as Design Option V-A.</u> 	<ul style="list-style-type: none"> <u>Same as proposed project except Light and glare effects in Bayside Manor neighborhood in Millbrae.</u> 	<ul style="list-style-type: none"> Same as Alternative VI.

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Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option*
Visual Quality (continued)											
• Streetscape	• Hickey Station potentially enhances streetscape in South San Francisco.	• Same as proposed project.	• No effect.	• No effect.	• <u>Alters streetscape in San Bruno in vicinity of aerial segment and station.</u>	• Same as proposed project <i>plus</i> • <u>Same as the Base Case Alternative.</u>	• Same as proposed project <i>plus</i> • Alters streetscape in San Bruno with I-380/San Bruno and Downtown San Bruno Station options.	• Same as Alternative V.	• Same as Design Option V.	• Same as proposed project <i>plus</i> • Alters streetscape in San Bruno at Tanforan Station.	• Same as Alternative VI.
Cultural Resources											
• Direct Physical Disturbance	• Potential direct effects to arched, cut-stone bridge in South San Francisco.	• Same as proposed project.	• No effect.	• No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project <i>plus</i> • Relocation of the Millbrae Train Station, a structure on the National Register of Historic Places.	• Same as Alternative VI.
• Diminution of Historic Setting	• Diminution of setting in cemeteries in Colma. • Diminution of setting at Salem Memorial Park Office in Colma.	• Same as proposed project.	• No effect.	• No effect.	• Same as proposed project <i>plus</i> • Indirect effects on cemetery properties the Salem Memorial Park office, and the American Legion Post.	• Same as proposed project.	• Same as proposed project <i>plus</i> • Indirect effects to potentially historic downtown San Bruno properties.	• Same as Alternative V.	• Same as Alternative V.	• Same as proposed project.	• Same as Alternative VI.
Community Services											
	• <u>Increases demand for local emergency response.</u> • Minimal increase in water demand and wastewater treatment requirements.	• Same as proposed project	• Emergency response vehicles would still be delayed by train passbys in San Bruno and Millbrae.	• Negligible change in service demands.	• Same as proposed project.	• Same as proposed project with slightly greater demand due to one additional station.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
Geology											
• Seismic Effects	• Exposes BART facilities to potentially strong, seismically-induced groundshaking and lateral pressures. • Potential for seismically-induced strain on I-380 tunnel lining.	• Same as proposed project excluding seismic strain.	• No effect.	• Exposes roadway and transit improvements to potentially strong, seismically-induced groundshaking.	• Same as proposed project excluding seismic strain on tunnel.	• Exposes BART facilities to potentially strong, seismically-induced groundshaking and lateral pressures <i>plus</i> • Potential for seismically-induced strain on tunnel under Highway 101. • Potentially strong, seismically-induced groundshaking on facilities proposed on the SFIA property east of Highway 101.	• Same as proposed project excluding seismic strain on tunnel.	• Same as Alternative IV.	• Same as proposed project.	• Same as Alternative IV. <i>plus</i> • Potential for seismically-induced strain with Tunnel Construction Option.	• Exposes BART facilities to potentially strong, seismically-induced groundshaking and lateral pressures. • Potentially strong seismically-induced groundshaking on facilities proposed on the SFIA property east of Highway 101.
• Liquefaction/ Bay Mud Effects	• Exposes BART facilities, ALRS, and highway on off-ramps overlying San Francisco Bay Mud to seismically-induced, localized liquefaction and settlement.	• Same as proposed project.	• No effect.	• Exposes roadway and transit improvements to seismically-induced, localized liquefaction and settlement.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project excluding effects on highway on-/off- ramps.	• Same as Design Option V-A.	• Same as Design Option V-A.	• Same as Alternative VI.

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Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option *
Geology (continued)											
• Hydrostatic and Settlement Effects	• Exposes BART facilities below groundwater level to seismically-induced upward force. • Facilities involving spread footings would be susceptible to long-term ground settlement.	• Same as proposed project.	• No effect.	• Spread footings susceptible to long-term settlement.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
• Corrosive Subsurface Soils	• Potentially exposes underground structures to corrosive subsurface soils.	• Same as proposed project.	• No effect.	• No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
Biological Resources											
• Total Wetland Loss (approximate acreage of wetlands and creek channels)	• 2.42	• 2.62	• No effect.	• 1.09	• 1.82	• 1.80	• 1.26	• 1.27 to 1.28	• 1.12	• 0.87	• 1.01
• Loss of Wetland Habitats inhabited by the San Francisco Garter Snake, California Red-legged frog, and the San Francisco Forktail Damselfly	• 1.52 acres of wetland habitats and obstruction of movement corridors within sensitive wildlife species habitat.	• 1.54 acres of wetland habitats.	• Results in continued decline of San Francisco Garter Snake and Red-legged frog habitat.	• 0.93 acres of wetland habitats.	• 1.16 acres of wetland habitat.	• 0.91 acres of wetland habitat.	• 0.37 acres of wetland habitat.	• 0.40 to 0.41 acres of wetland habitat.	• 0.25 acres of wetland habitat.	• No displacement of wetlands habitats, resulting in the least impact of all alternatives.	• 0.89 acres of wetland habitat.
• Reduction in aquatic habitat value	• Additional drainage outfalls into existing waterways could convey runoff and pollutants into aquatic habitats.	• Same as proposed project.	No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
Hydrology and Water Quality											
• Flood Hazard	• Encroaches into the 100-year floodplain in Colma, South San Francisco, and on west of Bayshore parcel, and may increase risk of flooding in adjacent areas. • Reconstruction of a stretch of Colma Creek in South San Francisco would improve the discharge of stormwaters.	• Same as proposed project <i>except</i> • Retained cut segment in west of Bayshore parcel would disrupt drainage and increase flood hazards in this area.	• No flood control improvements to Colma Creek would be made.	• Same as proposed project <i>except</i> • No encroachment in Colma and San Bruno.	• Placement of a station in the 100-year floodplain of Colma Creek at Chestnut Boulevard, and encroaches into the 100-year floodplain on west of Bayshore parcel.	• Similar to proposed project but I-380/San Bruno Station option would encroach upon flood prone area in San Bruno.	• Similar to Alternative IV, but less encroachment on the west of Bayshore parcel.	• Same as Alternative V <i>except</i> • Less encroachment on the west of Bayshore parcel.	• Same as Design Option V-A <i>except</i> • No encroachment on west of Bayshore parcel.	• Similar to Alternative V-A (subway) <i>except</i> • No encroachment on San Bruno flood prone areas.	• Same as Alternative VI.
• Soil Erosion	• Results in significant erosion at the outlets of new and modified drainageways.	• Same as proposed project.	• No effect.	• Results in less erosion than the proposed project; avoids Cupid Row Canal.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as the proposed project.	• Results in less erosion than the proposed project because it avoids San Felipe - South Lomita Canal and existing culverts would be unaffected.	• Same as Alternative VI.

Note: Bold and underlined impacts indicate significant and unavoidable impacts.
Unshaded area is information presented earlier in the DEIR/SDEIS; new information is shaded and relates only to the Aerial Design Option.
* The impacts presented for the Alternative VI Aerial Design Option are for the entire project corridor, not just for the Aerial Design Option study area.

Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option*
Hydrology and Water Quality (continued)											
• Water Quality	• Results in increased runoff volumes (50 cfs) and greater pollutant loadings.	• Same as proposed project.	• No effect.	• Results in less runoff volumes (32 cfs) and pollutant loading than the proposed project.	• Same as proposed project.	• Results in less runoff volumes (34-39 cfs) and pollutant loading than the proposed project due to less ground disturbance.	• Results in less runoff volumes (34-44 cfs) and pollutant loading than the proposed project because it proposes one less station.	• Results in less runoff volumes (18-23 cfs) and pollutant loading than the proposed project because it proposes one less station.	• Same as Design Option V-A.	• Results in potentially the least runoff volume (18 cfs) of all BART build alternatives because of minimal increases in impermeable surfaces.	• Same as Alternative VI.
• Groundwater	• Displaces one cemetery well in Colma. • Potentially contaminates underlying aquifer	• Same as proposed project.	• No effect.	• No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
Noise (maximum estimate of sensitive receptors) ²											
• Groundborne Noise	• 121	• 77	• No effect.	• Not Applicable	• Not Applicable.	• 77	• 77	• 104	• 99	• 113	• 91
• Airborne Noise	• 119	• 216	• No effect.	• 118	• 354	• 267	• 268	• 193	• 170	• 84	• 151
• Vibration	• 162	• 156	• No effect.	• Not Applicable	• 136	• 195	• 180	• 195	• 196	• 201	• 169
• Site-specific Unavoidable Impacts	• None	• None	• None	• None	• None	• None	• None	• None	• None	• <u>Seven to eight homes in Millbrae would experience groundborne noise.</u>	• None.

Note: Bold and underlined impacts indicate significant and unavoidable impacts.
Unshaded area is information presented earlier in the DEIR/SDEIS; new information is shaded and relates only to the Aerial Design Option.
* The impacts presented for the Alternative VI Aerial Design Option are for the entire project corridor, not just for the Aerial Design Option study area.
2 Figures have been corrected to reflect the DEIR/SDEIS text.

Table ES-2 (continued)
Comparison of Key Impacts

Issue	Proposed Project Locally Preferred Alternative	I-380 Least-Cost Design Option	Alternative I No Build	Alternative II TSM	Alternative III Base Case	Alternative IV Airport Aerial East of Highway 101	Alternative V Minimum Length Subway to Millbrae	Design Option V-A Minimum Length Subway to Airport GTC	Design Option V-B Minimum Length Subway to San Bruno	Alternative VI Millbrae Ave. via Airport International Terminal	Alternative VI Aerial Design Option*
Air Quality											
• Reductions in emissions from 1993 No Build by 1998 (000 tons/yr):											
• Carbon Monoxide	• 318.9	• Similar to proposed project.	• Worsens regional air quality compared to all BART build alternatives.	• Similar to proposed project.	• Similar to proposed project.	• Similar to proposed project.	• Similar to proposed project.	• Similar to proposed project.	• Similar to proposed project.	• Similar to proposed project.	• Same as proposed project.
• Nitrogen Oxides	• 13.8										
• Reactive Organic Gases	• 20.6										
• PM 10	• 1.5										
• Highest Modeled 8-Hr CO Concentration in 1998	• 7.0	• 7.0	• 7.5	• 8.4	• 6.3	• 7.3	• 7.3	• Similar to Alternative V	• 7.1	• 6.5	• Same as Alternative VI.
• Conformity Assessment	• In conformance with the MTC resolution and Clean Air Act.	• Same as proposed project.	• No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
Public Health and Safety											
• Exposure to Hazardous Materials	• Introduces minimal volumes of hazardous materials for maintenance of facilities and equipment. • Low likelihood of exposure to known nearby contaminated sites.	• Same as proposed project.	• No effect.	• No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as Alternative VI.
• Exposure to Electromagnetic Fields (EMF)	• Minimal long-term exposure because of distance to and shielding of EMF sources from sensitive receptors.	• Same as proposed project.	• No effect.	• No effect.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.	• Same as proposed project.
Energy											
• Regional Consumption (in billions of Btus/day)	• 835.58	• 835.58	• 838.22	• 834.47	• 835.57	• 835.61	• 835.60	• 835.59	• 835.55	• 835.65	• 835.54
• BART Electrical Requirements (in millions of Btus/day)	• 300.03	• 295.37	• Not Applicable.	• Not Applicable.	• 290.25	• 333.91	• 322.85	• 307.0-307.58	• 267.89	• 371.29	• 255.57
Section 4(f) Evaluation (Loss of parklands)											
	• Herman Tot Lot and 7th & Walnut Parks in San Bruno.	• 7th & Walnut Park in San Bruno.	• No effect.	• No effect.	• Posy Park in San Bruno.	• Marino Vista Park in Millbrae.	• Posy Park in San Bruno and Marino Vista Park in Millbrae.	• Posy Park in San Bruno.	• Posy Park in San Bruno.	• Possible take at Lion's Field Park. ³	• Possible constructive use at Lion's Field Park.

Note: Bold and underlined impacts indicate significant and unavoidable impacts.
Unshaded area is information presented earlier in the DEIR/SDEIS; new information is shaded and relates only to the Aerial Design Option.
* The impacts presented for the Alternative VI Aerial Design Option are for the entire project corridor, not just for the Aerial Design Option study area.
3 Text has been corrected to reflect DEIR/SDEIS text.

Chapter 1

Introduction

1.1 HISTORICAL OVERVIEW

Alternatives Analysis Process

Since 1970, over 90 different rail transit alternatives have been evaluated in order to enhance regional mobility along the San Francisco to San Jose corridor. From 1990 to 1992 an Alternatives Analysis process focused on ways to improve and expand rail transit service on the San Francisco Peninsula. These previous studies are detailed in the *Summary of the Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement* (DEIR/SDEIS) and the *Draft Environmental Impact Report/Technical Appendix* for the BART–San Francisco Airport Extension (January, 1995). For further information regarding the historical background of the DEIR/SDEIS and for definitions of relevant terms (glossary), please refer to the DEIR/Technical Appendix.

In 1992, the San Francisco International Airport (SFIA) certified an Environmental Impact Report on its Master Plan which proposed a new International Terminal as well as a Ground Transportation Center and an Airport Light Rail System (ALRS). The Master Plan EIR acknowledged that a BART project into the airport might be considered in the future but that it would remain independent from Master Plan projects.

Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement

On January 13, 1995, BART, SamTrans, and the Federal Transit Administration (FTA) released the BART–San Francisco Airport Extension DEIR/SDEIS for a 60-day public comment period. The DEIR/SDEIS evaluated potential impacts and proposed mitigation measures for the following seven alternatives: the Proposed Project, which was selected at the conclusion of the 1992 Alternatives Analysis study as the Locally Preferred Alternative (1992 LPA); a “No Build” Alternative, which assessed the impacts of not undertaking any project (Alternative I); a Transit Systems Management Alternative, which analyzed the effects of future transportation improvements other than the BART extension (Alternative II); and four BART build alternatives (Alternatives III, IV, V, and VI) with terminus stations in San Bruno, the SFIA, or Millbrae. Three design options representing variations on the BART build alternatives were also studied.

DEIR/SDEIS Public Comment Period

The DEIR/SDEIS was circulated to approximately 440 agencies, organizations, and individuals and was made available at all libraries and city halls within the project corridor. One hundred and fifty persons testified at public hearings, held February 15, February 18, and March 4, 1995 to collect comments on the

DEIR/SDEIS. By the conclusion of the public comment period on March 13, 1995, 283 agencies, organizations, and individuals had submitted written comments on the DEIR/SDEIS. In total, approximately 2,300 discrete written and verbal comments were received. In late March, staff initiated the presentation of responses to public comments submitted during the DEIR/SDEIS review period. The final responses, along with modifications to the draft environmental document, will be packaged as the *Final Environmental Impact Report/Final Environmental Impact Statement* (FEIR/FEIS).

New Locally Preferred Alternative

Based on public comment and considerations of transit ridership, service to the SFIA, and environmental impacts, the BART and SamTrans Boards on April 27 and 28, 1995 selected Alternative VI—BART to Millbrae via the planned Airport International Terminal as the new LPA.¹ This decision defines Alternative VI as being the local recommendation for more detailed engineering and final environmental documentation.

The selected route follows the San Bruno branch of the Southern Pacific Transportation Company (SPTCo) railroad between Colma and San Bruno, and then merges with the CalTrain mainline through downtown San Bruno. South of Angus Avenue in San Bruno, the BART subway alignment turns southeast under Highway 101 to the planned International Terminal at the SFIA, and then turns southwest back under Highway 101 to the CalTrain mainline. The proposed extension terminates at a station at Millbrae Avenue in Millbrae, with a tailtrack extending 1,500 feet into Burlingame. Stations would be provided at Hickey Boulevard, Tanforan Shopping Center, the SFIA at the planned International Terminal, and at a BART/CalTrain intermodal station on Millbrae Avenue. The LPA calls for a subway configuration between Colma and South Spruce Avenue in South San Francisco; a retained cut alignment from South Spruce Avenue to San Bruno Avenue in San Bruno; a subway alignment through downtown San Bruno, turning southeast to the planned Airport International Terminal, and returning to the CalTrain mainline at Hillcrest Avenue in Millbrae; and an at-grade Millbrae Avenue Station with tailtracks extending south to Trousdale Avenue in Burlingame.

The BART and SamTrans Boards of Directors selected Alternative VI for the following reasons:

- *Greatest Community Support* - Daly City, Colma, South San Francisco, San Bruno, and Millbrae registered support of Alternative VI Tunnel, with conditions.
- *Greatest Improvement in Regional Mobility* - Alternative VI provides the highest level of BART ridership, increases new transit ridership and provides for intermodal connections among BART, CalTrain, SamTrans, and the SFIA Airport Light Rail System.
- *Preservation and Enhancement of the Environment* - The State Department of Fish and Game and the U.S. Environmental Protection Agency commented that the 1992 LPA and other alternatives with an intermodal station west of Highway 101 would result in potentially significant impacts on prime habitat for the San Francisco garter snake. The agencies also noted that Alternative VI is

¹ The selection of the Locally Preferred Alternative is documented in more detail in the *BART—San Francisco Airport Locally Preferred Alternative Report*, May 1995. This document is available for review at the BART office at 1000 Broadway, Oakland, California.

likely to be the Least Environmentally Damaging Practicable Alternative (LEDPA) since it would result in the fewest impacts to wetlands and the habitat of threatened and endangered species.

- *Direct Connectivity into the Airport* - Alternative VI provides direct service into the SFIA for the highest number of passengers. It offers high-speed, efficient transit service between San Mateo County, the SFIA, San Francisco, and the rest of the Bay Area.

1.2 PURPOSE OF THIS REPORT

This *Focused Recirculated Draft Environmental Impact Report/Supplemental #2 Draft Environmental Impact Statement* (FRDEIR/S#2DEIS) has been prepared to consider other options of bringing BART service into the SFIA. Consideration of these options was prompted by recent actions of the U.S. Congress, BART, and the San Francisco Airports Commission related to the project costs and implementation of the 1989 San Francisco International Airport Final Draft Master Plan (referred to in this document as the SFIA Master Plan). This plan outlines a number of infrastructure improvements to be implemented by the year 2006 to accommodate projected growth at the airport. Key improvements that would interface either with construction or operation of the Aerial Design Option, east of the western edge of the Highway 101, include the construction of an International Terminal, Ground Transportation Center/Rental Car Garage (GTC/RCG), Airport Light Rail System (ALRS), and new highway ramps into and out of the airport. These new options of bringing BART service to SFIA were not analyzed in the DEIR/SDEIS; they have only recently been developed in connection with SFIA Master Plan improvements, specifically for the new International Terminal, ALRS, and GTC/RCG, that have been further refined by the airport. This FRDEIR/S#2DEIS specifically accomplishes the following purposes:

- 1) It addresses the MTC Resolution No. 2451 which supported BART's preliminary engineering grant application to the FTA conditioned partially on the understanding that BART will identify and implement feasible cost containment strategies for the BART-San Francisco Airport Extension;
- 2) It addresses the directive from the U.S. Congress House Appropriations Committee to consider less expensive design options into the SFIA;
- 3) It addresses the BART Board of Directors June 29, 1995 motion and the SamTrans Board of Directors July 6 motion to pursue evaluation of the Option B Aerial Wye-Stub with an airport station located at the International Terminal;
- 4) It addresses the San Francisco Airports Commission July 25, 1995 motion supporting an Aerial Wye-Stub Option X with an airport station located in front of the new International Terminal; and
- 5) It addresses the BART Board of Directors September 12, 1995 Resolution and the San Francisco Airports Commission Resolution September 19, 1995 to adopt passenger service quality standards for a BART station in the San Francisco International Airport.

These five purposes are described in more detail below.

Metropolitan Transportation Commission Action

On April 26, 1995, the MTC passed Resolution No. 2451 which supported BART's grant application to the FTA for the next phase of preliminary engineering. The resolution was in part conditioned on the understanding that during preliminary engineering BART will identify and implement feasible cost containment strategies.

United States House of Representatives Committee Actions

On June 21, 1995 at the recommendation of the House Transportation Appropriations Subcommittee, the House Appropriations Committee recommended \$10 million in federal fiscal year 1996 funds for the BART airport extension. At the same time, BART was urged to evaluate new engineering solutions that provide direct BART service to the SFIA terminal area at less expense.

In response, BART staff identified a possible aerial connection to the SFIA as a design option to the mined tunnel proposal under the Alternative VI LPA. This FRDEIR/S#2DEIS addresses the technical feasibility, environmental impacts, and costs of two aerial wye-stub design options.

BART Board Action

On June 29, BART staff presented to the BART Board of Directors an aerial wye-stub design option to the Alternative VI LPA tunnel segment (referred to as Alternative VI Tunnel). Designated Alternative VI Aerial Design Option B, it would provide for an aerial wye-stub with a BART/ALRS station containing two tracks at a 68-foot elevation at the planned Airport International Terminal. The BART Board passed a motion expressing continued preference for the tunnel configuration to the SFIA, to the extent that funding is available, but directed staff to also evaluate Option B. This board action addressed the congressional direction to reduce the project cost and reevaluate the design for direct airport access. The board action also responded to a request by the Federal Aviation Administration (FAA), a cooperating agency for the DEIS. Specifically, the March 13, 1995 FAA comment letter on the DEIR/SDEIS stated that "underground construction compared to above ground or elevated system must be analyzed in detail from an environmental impact view point in addition to cost benefit."

Option B calls for two aerial (east-west) guideways to diverge from the BART mainline along the existing CalTrain tracks, one from the north and one from the south, and to proceed east towards the SFIA. The guideways would merge over Highway 101, continue east to the planned Airport International Terminal, enabling passengers to board/disembark at the north end of the planned International Terminal. The Aerial Design Option includes direct BART service between San Francisco and Millbrae along the CalTrain corridor, service between San Francisco and the SFIA, and service between Millbrae and the SFIA. Option B is fully described in Chapter 2 of this document.

On September 12, 1995, the BART Board of Directors adopted Resolution No. 4574, which established the following "Service Quality Standard" for any BART station in the SFIA. At least 50 percent of passengers arriving on BART should be able to reach the first ticket counter at their selected airline terminal location from the midpoint of the BART platform within a four to five minute walk without transfers.

To facilitate the most convenient connection, the following amenities should be available:

To facilitate the most convenient connection, the following amenities should be available:

- An appropriate quality of architectural treatment that integrates the BART station with the planned International Terminal, creating a sense of wholeness and leading to a seamless environment between BART and the Terminal;
- An appropriate quantity and quality of elevators, escalators, and moving walkways;
- Fully integrated graphics and signage to provide consistent and user friendly information to BART and airport patrons;
- Convenient and secure baggage handling close to the BART platform; and
- Convenient connection between BART and the ALRS.

Sam Trans Board Action

On July 6, 1995, the SamTrans Board of Directors unanimously authorized the General Manager to proceed with the evaluation of Design Option B as presented by BART staff.

San Francisco Airports Commission Action

On July 25, 1995, the San Francisco Airports Commission resolved that "the location for a Airport BART Station shall be in front of the planned International Terminal, under the Airport's proposed Light Rail System so that the platform for BART trains is at the same floor elevation as the departure lobby of the new International Terminal, with the eastern end of the BART Station abutting the western face of the new International Terminal ..." This station location is analyzed as Option X and is described in Chapter 2. In contrast, Option B is one level above the departure lobby and inside the planned International Terminal, or 900 feet east of the location adopted by the San Francisco Airports Commission. On August 22, 1995, the San Francisco Airports Commission reaffirmed their support for Option X.

At its meeting on September 19, 1995, the San Francisco Airports Commission passed a resolution adopting BART's Passenger Service Quality Standards described above. The adoption of this Resolution establishes Passenger Service Quality Standards for any airport station design which would ensure world class passenger connection for BART patrons at the San Francisco International Airport.

As described more fully in Chapter 2, Project Description, Options B and X include passenger convenience features that are consistent with the Quality Standard. It is anticipated that any BART airport aerial station design considered for adoption will incorporate features that are most consistent with the Quality Standards. Accordingly, the LPA that is adopted could include features of Design Options B and X that have been recently aired in the public forum, that are within the parameters described by Options B and X, and are consistent with the Quality Standard.

1.3 RELATIONSHIP OF THIS ENVIRONMENTAL DOCUMENT TO THE DEIR/SDEIS

This FRDEIR/S#2DEIS evaluates the Alternative VI Aerial Design Option B and X. This document is a "recirculation" of the DEIR prepared pursuant to CEQA and a supplement to the DEIS prepared pursuant to NEPA. (This document is a second supplemental DEIS in that it supplements both the AA/DEIS/DEIR and DEIR/SDEIS.) However, because Options B and X would replace only a portion of the 1995 LPA (Alternative VI of the DEIR/SDEIS), the new environmental analysis focuses only on the segment of

Alternative VI south of Angus Avenue in San Bruno to the end of the tailtracks in Burlingame. In this area (referred to hereafter as Alternative VI Tunnel), Aerial Design Option facilities differ from those proposed under Alternative VI. This FRDEIR/S#2DEIS does not evaluate the segment of the LPA alignment between the Colma BART Station and Angus Avenue in San Bruno because no changes to the 1995 LPA are being proposed for that segment.

The Millbrae Avenue Station plan is being reevaluated in this document because of the station's proximity to the proposed new track alignment and the proposed change in the number of BART trains serving the station under Options B and X. Reexamination of the Millbrae Avenue Station design also responds to SamTrans Resolution No. 1995-45, which in part resolved to facilitate cross-platform transfers between BART and CalTrain at the Millbrae Avenue Station. The FRDEIR/S#2DEIS evaluates a different Millbrae Avenue Station and tailtrack configuration than those included under Alternative VI Tunnel. In re-evaluating the Millbrae Avenue Station, certain elements of the Millbrae Avenue Station Area Concept Plan, published February 13, 1995 and adopted by the Millbrae City Council in Resolution 95-20, were incorporated. These station elements could apply to Alternative VI as design requirements to the 1995 LPA.

This document addresses only significant new or different impacts due to the Alternative VI Aerial Design Option. For each environmental subject area, the impacts of Options B and X are compared to Alternative VI Tunnel. The environmental setting is not described for each subject area since it is the same as that presented for Alternative VI in the DEIR/SDEIS.

There will be a 45-day public comment period and one public hearing for this FRDEIR/S#2DEIS. Following the public comment period, comments will be summarized, and along with this document and additional engineering and financial data, will be reviewed by the BART and SamTrans Boards as they consider modification of the LPA.

Subsequently, BART and SamTrans staff and consultants will prepare an FEIR/FEIS. The Responses to Comments portion of the FEIR/FEIS will combine responses to comments on the DEIR/SDEIS and the FRDEIR/S#2DEIS. The FEIR/FEIS will be distributed to the agencies, organizations, and individuals on the DEIR/SDEIS distribution list, as well as to all DEIR/SDEIS and FRDEIR/S#2DEIS commentors. The public will be appropriately notified of all opportunities to comment on this environmental document, and on their preferences for the various alternatives and design options evaluated.

After certification of the FEIR/FEIS, the BART and SamTrans Boards of Directors will consider a project for adoption. Subsequently, the FTA will consider adoption of the FEIS and issuance of a record of decision.

1.4 PURPOSE AND NEED

The BART–San Francisco Airport Extension is being advanced primarily to carry out the public mandate for the project, respond to a regional need to alleviate highway congestion, and improve air quality. These reasons are fully described in the DEIR/SDEIS.

In addition, while SFIA Master Plan projects and the BART–San Francisco Airport Extension are independent projects, the BART–San Francisco Airport Extension would accommodate airport expansion

if the SFIA goes forward with its proposed Master Plan projects, including the new International Terminal.

Chapter 2

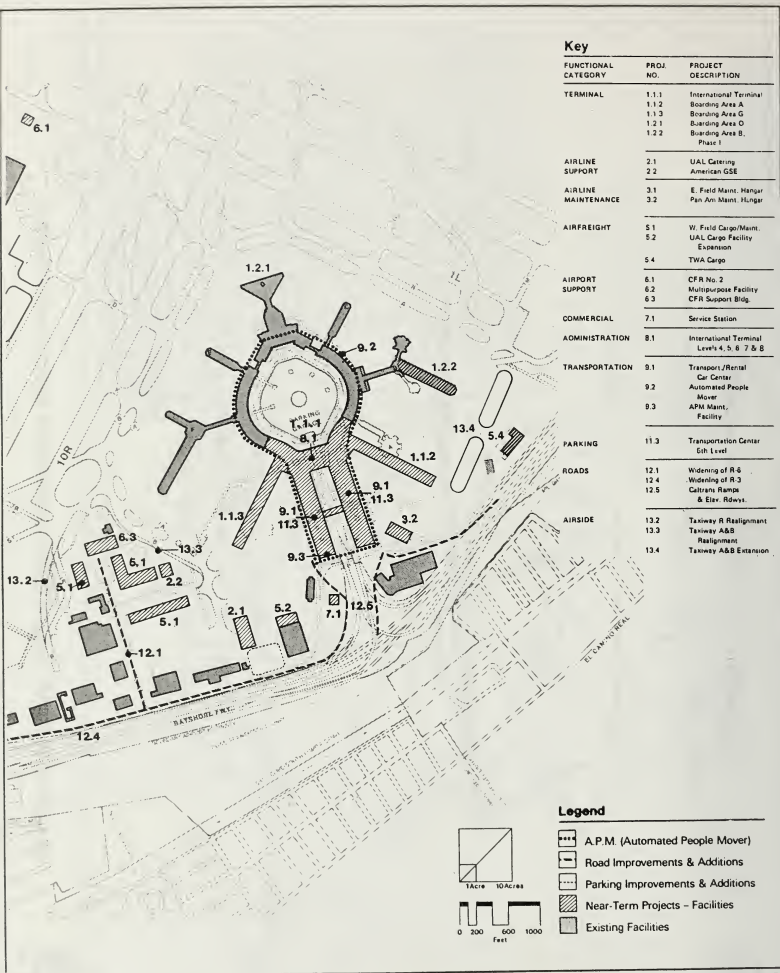
Project Description

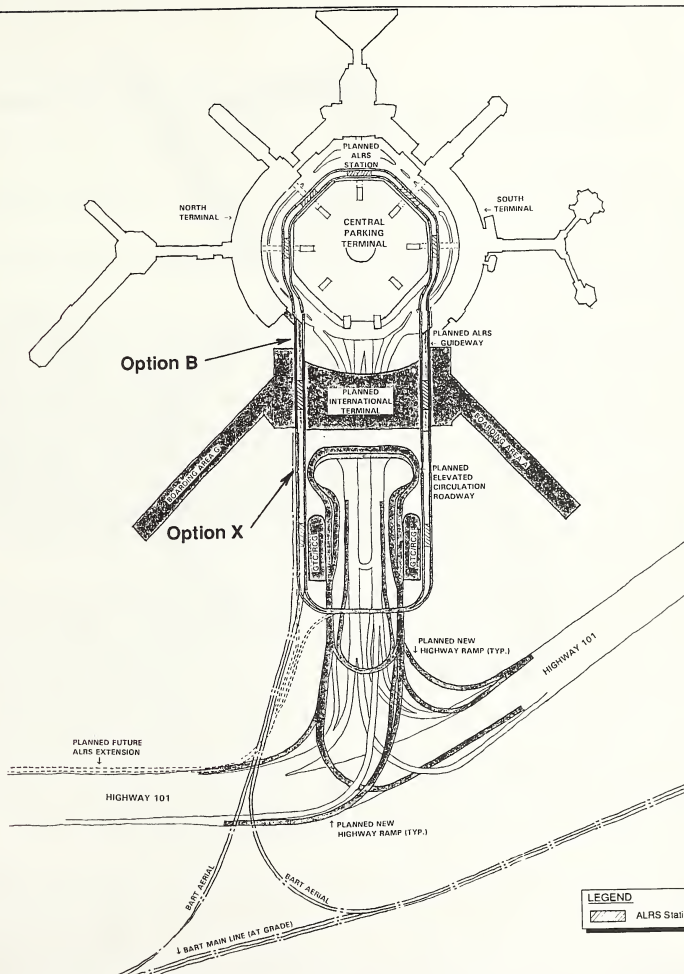
2.1 PROJECT DESCRIPTION

The Aerial Wye-Stub to the planned Airport International Terminal is a design option to the Locally Preferred Alternative (Alternative VI) for the BART–San Francisco Airport Extension project (see Figure 2-1). Also referred to as the Alternative VI Aerial Design Option, its alignment, stations, and ancillary facilities are identical to those of Alternative VI evaluated in the BART–San Francisco Airport Extension Summary of the Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (DEIR/SDEIS) from the end of the Colma tailtrack to Angus Avenue south of downtown San Bruno. The Aerial Design Option differs from Alternative VI only in the segment between Angus Avenue in San Bruno and the end of the Millbrae Avenue Station tailtrack in Burlingame. Instead of a tunneled subway alignment to the planned Airport International Terminal as in Alternative VI, this design option provides an east-west aerial wye-stub perpendicular to the CalTrain mainline terminating at the planned Airport International Terminal, proposed for construction by the San Francisco International Airport (SFIA) (see Figure 2-2). The Alternative VI Aerial Design Option would also provide straight-through mainline service along the CalTrain right-of-way to a Millbrae BART/CalTrain Station located at Millbrae Avenue.

Two different station locations are proposed for the BART Airport International Terminal Station. Option B would have the BART platform one floor above the departure level in the planned International Terminal. Option X proposes the BART platform at the same elevation as the departure level but in front (west) of the planned International Terminal. The length of the Alternative VI Aerial Design Option straight-through mainline from Angus Avenue to the Millbrae Avenue Station is 2.3 miles. From Angus Avenue to the Airport International Terminal Station, the alignment is 1.6 miles under Option B and 1.4 miles under Option X. The distance between the International Terminal Station and Millbrae Avenue Stations is 1.3 miles under Option B and 1.1 miles under Option X. As noted in Chapter 1, Introduction, both Options B and X would interface with a number of SFIA Master Plan improvements, including an International Terminal, Ground Transportation Center/Rental Car Garage (GTC/RCG), Airport Light Rail System (ALRS), and new highway ramps (see Figures 2-3 and 2-4)).

Both Options B and X include passenger convenience features that are consistent with BART and San Francisco Airports Commission Resolutions adopting BART Passenger Service Quality Standards. Option B provides key features which Option X does not - acceptable walking timeframes to and from the Terminal the Terminal Complex, and convenient connection between BART and the ALRS. However, Option X provides minimal facility level changes, because the station platform is one floor above the departure level in the planned International Terminal.





2.2 ROUTE DESCRIPTION AND ALIGNMENT

BART Alignment

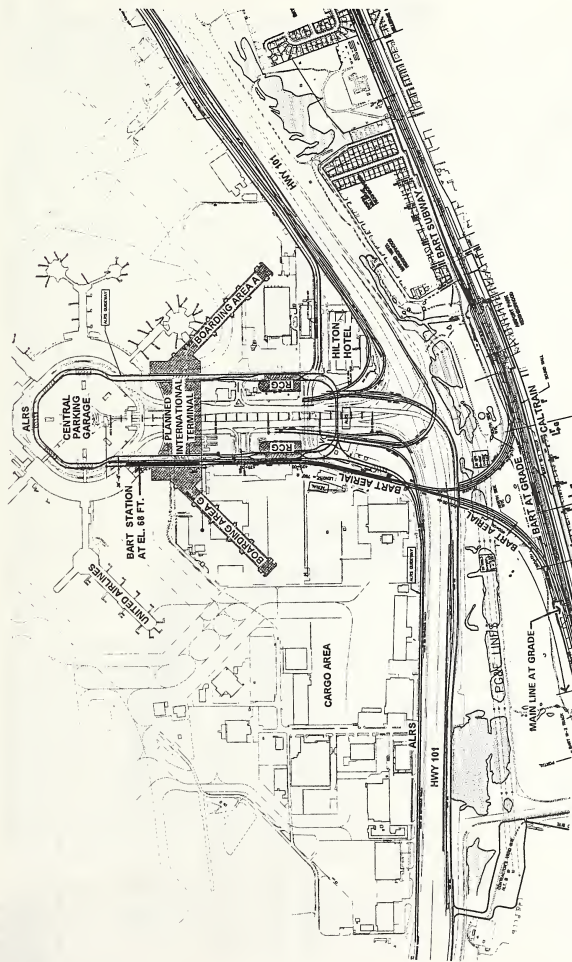
Town of Colma. The alignment is the same as that described for Alternative VI in Chapter 2, Section 2 of the DEIR/SDEIS.

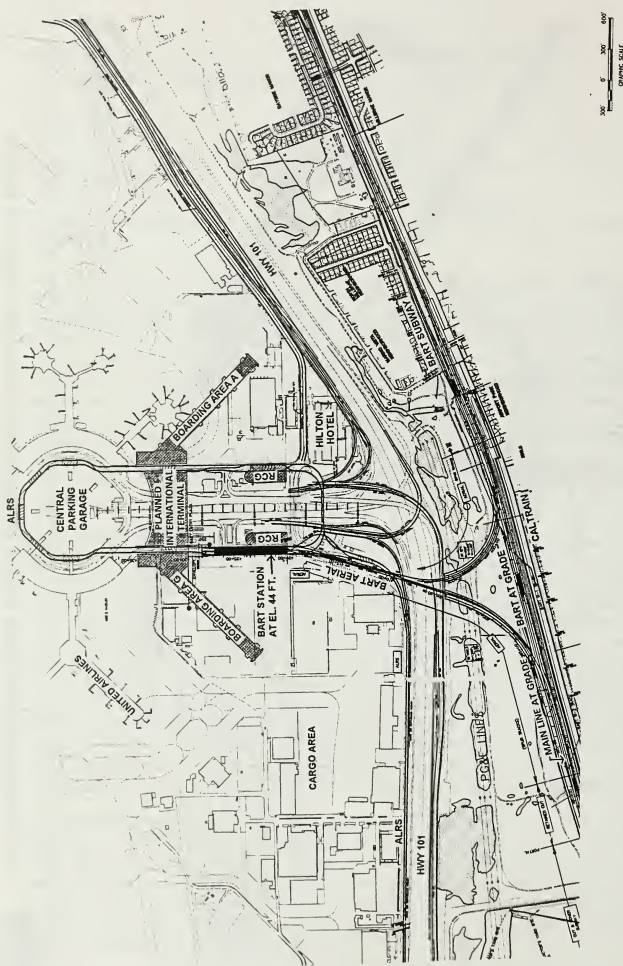
City of South San Francisco. The alignment is the same as that described for Alternative VI in the DEIR/SDEIS.

City of San Bruno. North of Angus Avenue, the alignment is the same as that described for Alternative VI with the San Bruno Tunnel Design Option in the DEIR/SDEIS. South of Angus Avenue, the subway alignment would transition from the west to the east side of the CalTrain tracks and continues in subway to Georgia Avenue (see attached Design Appendix A, the Aerial Design Option plan and profiles). Between Georgia Avenue and San Felipe Avenue, the north leg of the wye would divide from the mainline and the two lines would rise parallel to each other in retained cut. South of San Felipe Avenue, the mainline would continue south parallel to the CalTrain tracks to the Millbrae Avenue Station and the north leg of the wye-stub would curve east and rise via an aerial structure to the Airport International Terminal Station (see “SFIA Aerial Wye-Stub” below for descriptions of Options B and X wye-stub alignments into the SFIA). Between San Felipe Avenue and the San Bruno/Millbrae city boundary, south of Santa Helena Avenue, the mainline tracks would be at grade. Between San Felipe Avenue and Santa Lucia Avenue, the north leg of the wye would rise on columns and curve southeast.

SFIA Aerial Wye-Stub Under Option B. The wye-stub north and south legs would ascend from subway to retained cut parallel to the CalTrain tracks and then transition to at-grade then aerial and curve east on aerial structures (see Figure 2-5). The aerial structures would ascend and cross over the SFIA west of Bayshore property and over the PG&E tower line right-of-way, Highway 101, and the existing elevated highway ramps to the SFIA. The aerial structures would cross Highway 101 approximately 50 feet above the ground and rise to a station 68 feet above grade. Over the airport highway ramps, the north and south legs of the wye join to form one structure with three tracks parallel to the SFIA north access road. The BART aerial structure would be incorporated into the SFIA structures supporting the ALRS and roadway ramps. Approximately 400 feet east of the GTC/RCG, proposed for construction by the SFIA, a crossover would be provided for the center track to join either outside track terminating at a center platform aerial station located at the planned Airport International Terminal building. Crossovers between tracks to facilitate train operations are also provided at the following locations: Highway 101; the highway viaduct; two near the McDonnell Road underpass; and two near the planned GTC/RCG.

SFIA Aerial Wye-Stub Under Option X. The Design Option X aerial wye-stub is identical to Option B except for the following: the aerial structures would cross over Highway 101 at approximately 50 feet, merge, descend to 44 feet above grade, and terminate at a station approximately 200 feet in front of the Airport’s planned International Terminal building (see Figure 2-6). The station would provide two center platforms with a total of three slots for trains. Crossovers between tracks to facilitate train operations would also be provided at the following locations: over Highway 101; the highway viaduct; and across from the United Airlines administration building.





City of Millbrae. From Santa Helena Avenue to the south boundary of Lomita Park School, the mainline tracks would be at grade and the eastbound and westbound tracks of the south leg of the wye would descend on aerial columns, curve to the southwest over the mainline tracks, and descend to grade (see attached Design Appendix). South of Lomita Park School, the mainline and the south leg of the wye would descend parallel to each other in retained cut and enter a subway portal approximately 300 feet north of Madrone Street. The BART alignment would be in subway between north of Madrone Street and San Rey Avenue and then would rise in retained cut to at grade 200 feet north of the Millbrae Avenue Station. South of the station, the at-grade turnback/tailtracks would extend a total of approximately 2,200 feet, approximately 700 feet in Millbrae and 1,500 feet in Burlingame.

City of Burlingame. The 1,500 feet of at-grade turnback/tailtracks in Burlingame would be within the CalTrain right-of-way (see attached Design Appendix). The tailtrack south of the Millbrae Avenue Station is similar to the tailtrack under Alternative VI except that a fourth track has been added to accommodate a BART/CalTrain cross platform transfer and the shuttle train to/from the SFIA. This fourth track for the shuttle train would extend approximately 1,200 feet south of the Millbrae Avenue Station platform, approximately 700 feet in Millbrae and approximately 500 feet in Burlingame. Train storage for up to 60 BART cars would be provided on the tailtracks south of the Millbrae Avenue Station.

Station Design Features

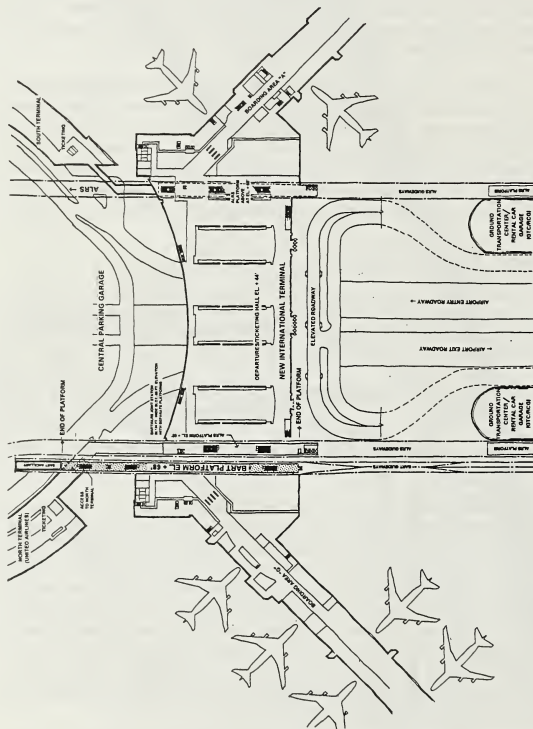
Four stations would be provided as part of the Alternative VI Aerial Design Option: 1) Hickey; 2) Tanforan; 3) Airport International Terminal BART/ALRS; and 4) Millbrae BART/CalTrain Intermodal. Facilities for disabled persons will be provided at the stations to meet state and federal requirements regarding accessibility.

Hickey Station. The Hickey Station would be the same as that described for Alternative VI in the DEIR/SDEIS.

Tanforan Station. The Tanforan Station would be the same as that described for Alternative VI in the DEIR/SDEIS.

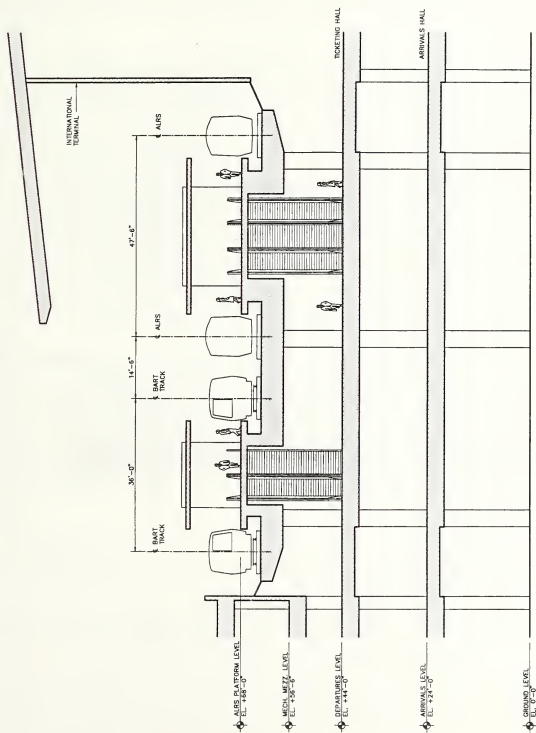
Airport International Terminal Station Option B. This station option would be constructed in an elevated configuration adjacent to the ALRS at the planned Airport International Terminal and in front of the north terminal (United Airlines) (see Figure 2-7). The station platform would be approximately 68 feet above grade, one floor above the departure level of the planned Airport International Terminal (see Figure 2-8). The east end of the station would be one level above and in front of the north terminal (United Airlines). Access to the north terminal is by escalators and walking. The west end of the station would provide direct access to the planned Airport International Terminal. Other terminals would be accessed by taking an escalator down and then up and transferring to the ALRS proposed to be constructed by SFIA, or by escalators and then walking. The planned GTC/RCG, United Airlines maintenance facility, and employee areas north of the terminals would be accessed by transferring to the ALRS. No BART patron parking would be provided at the station.

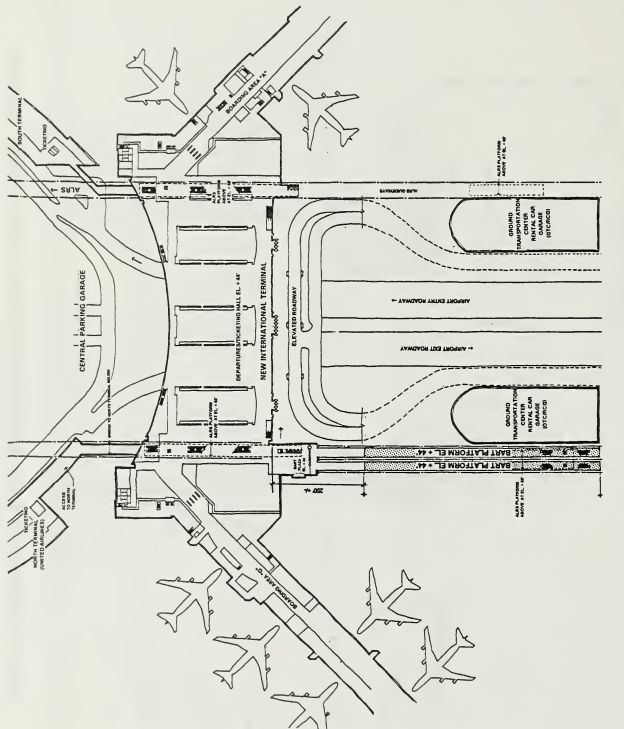
Airport International Terminal Station Option X. This station option would be constructed in an elevated configuration with the eastern end of the BART station approximately 200 feet in front (west) of the western face of the planned International Terminal (see Figure 2-9). The station platform with three



FIGURE

Option B Station Site Plan





tracks would be approximately 44 feet above grade, at the departure level of the International Terminal and one level below the ALRS station at the GTC/RCG (see Figure 2-10). Access to the north terminal (United Airlines) would be by walking or taking an escalator up and transferring to the planned ALRS station at the GTC/RCG. Other terminals would probably be accessed by transferring to the planned ALRS station at the GTC/RCG. The United Airlines maintenance facility and other employee areas north of the terminals would be accessed by transferring to the ALRS. No BART patron parking would be provided at the station.

Millbrae Avenue Station. The at-grade Millbrae Avenue Station is shown in Figure 2-11. The existing CalTrain station building and tracks would be moved approximately 12 feet to the west. The CalTrain station platform would be relocated to the BART Millbrae Avenue Station approximately 1,000 feet north. The BART and one of the CalTrain station platforms would be located side-by-side, with transfers either by a cross platform transfer or by an aerial bridge (see Figure 2-12). Approximately 3,000 parking spaces would be provided (approximately 2,085 in a four-story parking structure and approximately 915 in three surface lots). A pedestrian bridge would connect the parking structure and surface parking with the BART and CalTrain mezzanines. The main vehicular access for commuters from the south would be via Highway 101 and Millbrae Avenue. Local access to the station would primarily be via Millbrae Avenue, El Camino Real, Rollins Road, or California Drive. A new connection is also proposed between the BART parking garage and Adrian Road south of Millbrae Avenue (see "Roadway" below for additional details). As part of the Millbrae Avenue grade separation project, California Drive would be extended to Linden Avenue. The California Drive extension provides access to the station from the west.

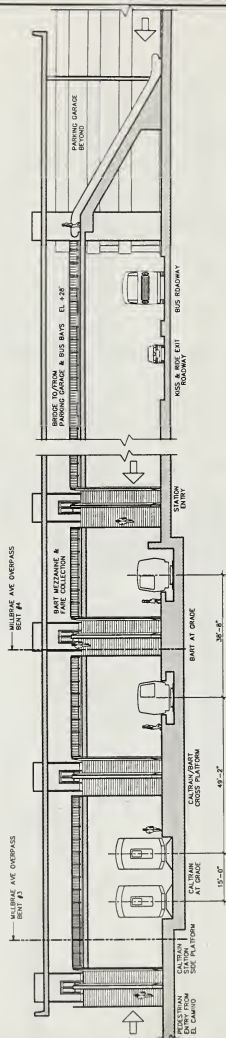
Ancillary Facilities

Key ancillary facilities include traction power substations, ventilation buildings and tailtracks. Traction power substations take 34,500 volt electricity from PG&E and use transformers to reduce the voltage and rectifiers to convert the alternating current to 1,000 volt direct current. This current is supplied to the third rail to power BART trains. Ventilation buildings include large fan rooms and air shafts to circulate air. Tailtracks are storage tracks at the end of the line. Other ancillary facilities include train control bungalows, joint breaker stations, car wash facilities, and radio antennae for communications throughout the system.

The Daly City Shop/Colma Station Modifications and Hickey and Tanforan Stations. Ancillary facilities would be identical to those described for Alternative VI in the DEIR/SDEIS.

Airport International Terminal Station. A traction power substation and train control bungalow would be located either underneath the aerial alignment near either Airport International Terminal Station option or at-grade and immediately east of Highway 101 under the aerial alignment.

Millbrae Avenue Station. Ancillary facilities would be identical to those described for Alternative VI in the DEIR/SDEIS except for the following: 1) the traction power substation and train control bungalow would be located south of the existing storm drainage channel and east of the CalTrain right-of-way instead of under the Millbrae Avenue overpass; and 2) a gap breaker station would be located north of Murchison Drive. These same facilities could apply to Alternative VI as design requirements to the 1995 LPA.



WEST

EAST

OGDEN

Millbrae Avenue BART/CalTrain Station Section with Cross Platform Transfer

FIGURE

2-12

Burlingame. A one-car emergency inspection pit would be located along the turnback/tailtrack tracks in Burlingame.

Other. Traction power substations, ventilation buildings, gap breaker stations, train control bungalows, utility power feeds, and radio antennae north of Angus Avenue in San Bruno are the same as those described for Alternative VI in the DEIR/SDEIS except the pocket track and car wash facility north of the Tanforan Station would be replaced by an auxiliary track and car wash facility in San Bruno. The auxiliary track would be located at grade parallel to and east of the CalTrain tracks between Santa Inez Avenue and Santa Clara Avenue in San Bruno. The primary function of the auxiliary track would be to provide train access to the car wash facility, with a secondary function of train storage for up to two 10-car trains. The rail car wash facility and support building would be located across from Santa Clara Avenue along the auxiliary track. The CalTrain right-of-way and the existing dirt road alongside Lion's Field Park and terminating at First Street, which would be improved, would be used to access this facility.

A landscaped sound wall would be provided on the western edge of the CalTrain mainline right-of-way from approximately 400 feet north of San Felipe Avenue in San Bruno to the subway portal approximately 300 feet north of Madrone Street in Millbrae.

A traction power substation, train control bungalow, and a 25-foot radio antenna would be located at the site of the existing San Bruno CalTrain Station. A gap breaker station would be located at-grade across from San Felipe Avenue east of the CalTrain tracks in San Bruno.

A below-grade gap breaker station would be located east of the CalTrain tracks near Pine Street in Millbrae. A ventilation shaft would be located above the subway alignment across from Mateo Avenue in Millbrae. A wall would extend from Murchinson Drive to the end of the tailtracks approximately 500 feet south of Trousdale Drive in Burlingame.

The utility power feed would be the same as that described for Alternative VI.

The existing overhead PG&E power transmission lines west of Highway 101 would be converted to underground transmission lines for approximately 1,000 feet to make room for the BART aerial wye-stub alignment to the Airport International Terminal Station.

Transit

Background transit improvements would be identical to those described for Alternative VI in the DEIR/SDEIS.

Roadways

Road improvements at the Millbrae Avenue Station vicinity are the same as those described under Alternative VI in the DEIR/SDEIS except for the following: a new one-way southbound circulation street, east of the BART/CalTrain tracks would connect the BART station front door and parking facilities to Adrian Road, south of Millbrae Avenue.

Operating Characteristics

BART would provide three kinds of service with the Aerial Design Option: 1) service from the East Bay through San Francisco to the Airport International Terminal Station; 2) straight through mainline service from the East Bay through San Francisco to the Millbrae Avenue Station; and, 3) a dedicated Millbrae to SFIA shuttle train. Table 2-1 shows the average headways.

Conceptually, during peaks periods, BART would operate with two trains serving the Millbrae Avenue Station on the straight-through mainline alignment for approximately every one serving the Airport International Terminal Station. Peak period trains through San Francisco to the Airport International Terminal Station would arrive every 13.5 minutes, while trains from Tanforan to Millbrae would have alternating headways of 4.5 and 9 minutes with an average headway of 6.75 minutes. Where feasible, peak direction trains would be routed for cross platform transfers between CalTrain and BART.

Weekdays and Saturday except late night, BART would provide a dedicated shuttle train operating between the Millbrae Avenue and the Airport International Terminal Stations. The BART shuttle service would be coordinated with northbound CalTrain arrivals at the Millbrae Avenue Station.

Late night weekdays and Saturday and all day Sunday, BART provides two-route "X service" with trains from Concord to the westbay and trains from Richmond to Fremont. During these times, the BART shuttle service will not operate and the Concord route through San Francisco would first provide service to the Airport International Terminal Station and then serve the Millbrae Avenue Station on 20-minute headways. Persons on the Richmond to Fremont route would need to transfer in downtown Oakland in order to catch a westbay bound train.

BART's design criteria include the minimum headway of 1.5 minutes between trains. The aerial wye-stub, because of its physical configuration and train control requirements, may have minimum headways of up to three minutes. The BART operating characteristics described above were assumed for planning purposes for the Alternative VI Aerial Design Option. The actual service levels may be different because, per the BART/SamTrans Comprehensive Agreement¹, the SamTrans Board of Directors in consultation with the BART Board of Directors has the right to prescribe the level of service to stations south of the existing Daly City Station. BART also must determine that the service levels would be compatible with existing system operations.

SamTrans bus routes would be re-oriented to serve the stations proposed under this Aerial Design Option, in a manner identical to Alternative VI Tunnel.

¹ The BART/SamTrans Comprehensive Agreement Pertaining to BART System Extensions, signed March 1, 1990, specified the respective responsibilities of BART and SamTrans for proceeding with necessary environmental work, funding, construction, and operation of the BART extension to the vicinity of the San Francisco Airport.

Table 2-1
BART-San Francisco Airport Extension
Aerial Design Option
Average Headways (Minutes)

Period	Service to Hickey and Tanforan Stations	East Bay Service to the SFIA	Mainline Service Tanforan to Millbrae Avenue	Millbrae to the SFIA
Weekday Service Summary				
Start up 4AM-6AM	20	20	20	--
AM Peak 6AM - 9:30AM	4.5	13.5	6.75 ¹	15 ²
BASE 9:30AM - 3PM	7.5	15	15	15 ²
PM Peak 3PM - 7PM	4.5	13.5	6.75 ¹	15 ²
Night 7PM - 12AM	20	20	20	20
Saturday Service Summary				
Start up/Day 6AM - 7PM	10	20	20	20 ^B
Night 7PM - 12AM	20	20	20	20
Sunday Service Summary				
Day 8AM - 7PM	20	20	20	20
Night 7PM - 12AM	20	20	20	20

Footnotes:

- ¹ Trains from Tanforan to Millbrae would have alternating headways of 4.5 and 9 minutes resulting in an average headway of 6.75 minutes.
- ² Shuttle train service between Millbrae Avenue and the Airport International Terminal Station.

Chapter 3

Environmental Analysis

OVERVIEW TO THIS CHAPTER

This chapter presents the environmental analysis of the Alternative VI Aerial Design Option (including Option B and Option X for the aerial wye-stub location at the SFIA). For each environmental issue (e.g., air quality, traffic, visual quality, cultural resources, etc.), the following four sections are presented:

- **Existing Conditions.** The alignment for the Aerial Design Option lies within the project corridor defined for the BART–San Francisco Airport Extension. Accordingly, the baseline conditions for this alignment are identical to those presented in the *Summary of the Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement* (DEIR/SDEIS). This Existing Conditions section identifies where a description of the affected environment can be found in the DEIR/SDEIS for the proposed project.
- **Significance Criteria.**¹ The thresholds, or criteria, used to determine and evaluate the significance of impacts identified for the Aerial Design Option are identical to those used in the DEIR/SDEIS. This Significance Criteria section identifies where the relevant criteria can be viewed in the DEIR/SDEIS.
- **Project-Specific Impact Assessment and Mitigation Measures.** This section evaluates how the Alternative VI Aerial Design Option would affect baseline conditions and classifies impacts as significant, insignificant, or beneficial. Each impact is numbered and prefaced by an italicized summary impact statement that highlights the classification of the impact [i.e., significant (S), insignificant (I), or beneficial (B)]. The subsequent discussion provides an analysis of the impact and a rationale for the significance classification. To facilitate review of the impacts, this section distinguishes impacts associated with the mainline through San Bruno, Millbrae, and Burlingame from impacts directly related to the aerial wye-stub and the Airport International Terminal Station.

Mitigation measures are presented after impacts classified as significant. If an impact is insignificant or beneficial, mitigation measures are not required but are occasionally suggested for insignificant impacts. BART may or may not adopt any of the mitigations. The measures are

¹ As described in the DEIR/SDEIS on Pages 1-4 through 1-6, the requirements of NEPA and CEQA are not the same. The FRDEIR/S#2DEIS has been prepared in compliance with the more stringent or more complete requirements whether they be federal or state. For example, as described on Page 1-5 of the DEIR/SDEIS, each significant impact of the Aerial Design Option is identified in order to meet the requirements of CEQA.

numbered to coincide with the impact statement they address. For example, Mitigation Measure 2.1 refers to the first mitigation for Impact 2.

As noted in Chapter 1, Introduction, this document presents an aerial version of Alternative VI Tunnel. This section indicates whether the Aerial Design Option results in impacts that are:

- the same as those identified for Alternative VI Tunnel;
- similar but of a different severity or magnitude;
- entirely new and unique to the design option; or
- newly identified but would also be applicable to Alternative VI Tunnel.

In addition, it is noted if the Aerial Design Option eliminates an impact that would be anticipated under Alternative VI Tunnel.

- **Cumulative Assessment.** This section considers the impacts of the Alternative VI Aerial Design Option in concert with the impacts of other development within the study area. Although the impacts of an individual project may be insignificant, the purpose of this assessment is to consider whether the project, if carried out simultaneously with other approved or proposed projects, may cumulatively have a significant effect. The one project in the study area whose impacts could cumulate with those of BART is the development envisioned in the *San Francisco International Airport Final Draft Master Plan*, which identifies future projects at the SFIA.

Section 1

Transportation

1.1 EXISTING CONDITIONS

Information regarding the existing conditions at the San Francisco International Airport (SFIA), and for public transportation, roadways, parking and bicycle routes, and rail freight service can be found in Chapter 3, Section 1.1 of the DEIR/SDEIS. The area of particular focus for the transportation assessment of the Aerial Design Option is defined as Broadway Avenue in the City of Burlingame to the south, Interstate 280 (I-280) to the west, Angus Avenue to the north, and the San Francisco Bay to the east. This study area is larger than the one described in Chapter 1 (the transportation study area extends further to the west), because travel between I-280 and the Millbrae Avenue Station is important to evaluating traffic impacts in this environmental document.

1.2 TRANSIT IMPACT ASSESSMENT AND MITIGATION

This section presents information on transit boardings, transfers, and station volumes for the Alternative VI Aerial Design Option. The project-specific effects of the Aerial Design Option are compared to those of the No Build Alternative, as well as those of Alternative VI.

Significance Criteria and Methodology

The significance criteria and methodology for determining and assessing transit impacts of the Aerial Design Option are described in Chapter 3, Section 1.2, of the DEIR/SDEIS.

Project-Specific Analysis

Impacts to mass transit vehicle requirements; mileage operated for BART, CalTrain and SamTrans; geographic coverage of transit; reliability of transit service; improvements to transit passenger facilities and amenities; and relief from crowded conditions projected for the Colma BART Station are the same as those identified for Alternative VI (in Chapter 3, Section 1.2, of the DEIR/SDEIS). New or different transit impacts of the Aerial Design Option are enumerated below.

In addition, information on the transportation impacts of the CalTrain Downtown Extension and the BART-San Francisco Airport Extension are included in this document because of two events that have occurred since the analysis prepared for the DEIR/SDEIS. In March 1994, the Peninsula Joint Powers Board (JPB), the agency responsible for the CalTrain operations and development, adopted a resolution

requesting the MTC to include a specific CalTrain Downtown Extension alternative in the MTC Regional Transportation Plan. The second occurrence is the initiation of a Draft Environmental Impact Statement/Draft Environmental Impact Report by the JPB. The study is expected to be completed in spring 1996. The impacts of the BART extension with the CalTrain Downtown Extension are based on the analysis in the AA/DEIS/DEIR and are presented for informational purposes in this document. This information is based on the analysis in the AA/DEIS/DEIR to maintain consistency with the assumptions used in each of the environmental documents prepared for the BART–San Francisco Airport Extension.

1. *Under the Alternative VI Aerial Design Option, transit travel times would improve for most transit users traveling between points in northern San Mateo County and San Francisco or the East Bay. For other transit users, travel times would stay the same, or in some cases, increase by a small amount. (B)*

Table 3.1-1 shows transit travel times between selected origins and destinations. Compared to the No Build Alternative, transit travel times would generally be less under the Aerial Design Option (either Option B or X). This is considered a beneficial effect.

For 47 of 49 origin/destination pairs in the table, transit travel times would improve or remain unchanged. Some locations would experience minor increases (two minutes or less) in travel times, as a result of reduced bus service on SamTrans routes that duplicate service offered by the BART extension. These cases, however, are few and the overall impact of the Aerial Design Option is beneficial. Travel times to the SFIA terminals would be longer under the Aerial Design Option than under Alternative VI because of longer headways.

2. *Transit boardings on BART and CalTrain would increase, but boardings on SamTrans would decrease under the Aerial Design Option compared to the No Build Alternative. (B)*

Table 3.1-2 shows the daily transit boardings for BART, CalTrain, the ALRS, and SamTrans under the Alternative VI Aerial Design Option (either Option B or X). As indicated, BART and CalTrain would experience increased boardings, while SamTrans boardings would decrease because the proposed rail improvements would attract patrons who formerly rode the bus.

Boardings on BART, CalTrain, SamTrans, and the ALRS would modestly decrease under the Aerial Design Option compared to Alternative VI. BART boardings would decline by 900 trips under Option B and by 1,000 trips under Option X in 2010 compared to Alternative VI because of the longer headways between trains at the planned Airport International Terminal and Millbrae Avenue Stations. Given the limitations in the patronage forecast methodology as described in Chapter 3, Section 1.2 of the DEIR/SDEIS, the difference in boardings between Option B and Option X is insignificant.

ALRS boardings would be significantly lower for the Aerial Design Option compared to the other build alternatives not because of a decrease in transit patronage but due to the large number of pedestrians at the Airport International Terminal Station. These walk trips constitute a benefit since they would eliminate the need to transfer to another mode, and still offer the choice to conveniently transfer to the ALRS. The changes to ALRS boardings are not considered significant impacts because overall transit ridership would improve, reducing auto use.

Table 3.1-1
Alternative VI Aerial Design Option
Transit Travel Times (Minutes)(1)
A.M. Peak Period (2010)

Northbound		Destinations					
Origins		S.F. State	S.F. Civic Center	Union Square	Maritime Plaza	Oakland Center	
Hillsdale CalTrain	Travel Time	50	55	52	55	69	
	Change From No-Build	-24	-4	2	2	0	
	Change From Alt. VI-Tunnel	1	1	0	0	0	
Airport Intermodal Station Site	Travel Time	33	38	37	41	53	
	Change From No-Build	-14	-7	-2	-1	-4	
	Change From Alt. VI-Tunnel	1	1	0	0	1	
SFIA Terminals	Travel Time	45	43	48	52	63	
	Change From No-Build	-6	0	0	0	0	
	Change From Alt. VI-Tunnel	8	1	5	6	6	
So. San Francisco CalTrain	Travel Time	43	46	37	40	55	
	Change From No-Build	-12	0	0	0	0	
	Change From Alt. VI-Tunnel	0	0	0	0	0	
Hickey BART	Travel Time	24	29	30	32	46	
	Change From No-Build	-6	-19	-8	-8	-8	
	Change From Alt. VI-Tunnel	0	0	0	0	0	
Southbound		Destinations					
Origins		Kaiser Medical	Tanforan Shopping	San Bruno City Hall	Hillsdale Shopping	SFIA Terminals	UAL (SFIA)
12th Street BART (Oakland)	Travel Time	41	47	58	86	61	62
	Change From No-Build	-24	-27	-15	0	0	-18
	Change From Alt. VI-Tunnel	0	0	0	0	4	2
Montgomery St. BART	Travel Time	32	34	43	72	44	47
	Change From No-Build	-18	-25	-15	-1	0	-4
	Change From Alt. VI-Tunnel	0	0	0	1	2	2
Civic Center BART	Travel Time	28	30	39	68	37	41
	Change From No-Build	-18	-25	-15	-3	0	3
	Change From Alt. VI-Tunnel	0	0	0	1	0	0
Daly City BART	Travel Time	13	15	24	53	31	28
	Change From No-Build	-11	-18	-9	-18	-19	-14
	Change From Alt. VI-Tunnel	0	0	0	1	8	2

Source: Parsons Brinckerhoff, July 1995

- 1) Travel times include walk or transit access time to final destination. It does not include origin station access time which varies depending on location of traveller's origination. Travel times assume utilization of the fastest mode (i.e., bus, BART, or CalTrain). Times shown are unweighted. Times apply to both Alternative VI Design Options except for SFIA Terminals to S.F. State and Daly City to SFIA Terminals for which Design Option B would be 2 minutes faster in each case.

**Table 3.1-2
Alternative VI Aerial Design Option
Daily Transit Operator Boardings (1)**

Transit System	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
BART without CalTrain Extension	312,800	312,700	358,900	358,900	401,500	401,400
BART with CalTrain Extension (2)	300,400	300,300	344,700	344,600	385,600	385,500
CalTrain without Downtown Ext.	36,400	36,400	41,700	41,700	46,700	46,700
CalTrain with Downtown Ext. (2)	45,000	45,000	51,700	51,700	57,800	57,800
SamTrans	66,500	66,500	76,300	76,300	85,400	85,400
Airport Light Rail System	3,900	3,900	5,000	5,000	6,200	6,200
Change From Alternative I (No Build)						
Transit System	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
BART without CalTrain Extension	56,800	56,700	37,600	37,600	42,100	42,000
BART with CalTrain Extension (2)	44,400	44,300	23,400	23,300	26,200	26,100
CalTrain without Downtown Ext.	15,600	15,600	12,100	12,100	8,900	8,900
CalTrain with Downtown Ext. (2)	24,200	24,200	22,100	22,100	20,000	20,000
SamTrans	(7,300)	(7,300)	(5,000)	(5,000)	(2,800)	(2,800)
Airport Light Rail System	3,900	3,900	5,000	5,000	6,200	6,200
Change From Alternative VI (3)						
Transit System	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
BART without CalTrain Extension	(700)	(800)	(800)	(800)	(900)	(1,000)
BART with CalTrain Extension (2)	(13,100)	(13,200)	(15,000)	(15,100)	(16,800)	(16,900)
CalTrain without Downtown Ext.	(100)	(100)	(200)	(200)	(200)	(200)
CalTrain with Downtown Ext. (2)	8,500	8,500	9,800	9,800	10,900	10,900
SamTrans	(300)	(300)	(400)	(400)	(400)	(400)
Airport Light Rail System	(200)	(200)	(200)	(200)	(200)	(200)

Source: MTC, BART-SFO AA/DEIS/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO DEIR/SDEIS Patronage Forecasts, October 1993
Parsons Brinckerhoff, July 1995

- 1) Boardings are the total number of patrons entering transit vehicles from all sources including transfers, auto and walk access. More transfers occur between BART and CalTrain without the CalTrain Downtown Extension than with the Downtown Extension. Therefore, the sum of boardings for BART and CalTrain are greater without the Downtown Extension. However, total regional transit person trips, which do not include transfers, would be greater with the Downtown Extension.
- 2) Patronage estimates not from MTC's regional model but rather based on changes in Base Case and 1992 LPA for boardings with and without CalTrain Downtown Extension as forecasted in the AA/DEIS/DEIR.
- 3) Alternative VI as described in the DEIR/SDEIS, i.e., without the CalTrain Downtown Extension.

The Metropolitan Transportation Commission (MTC) Regional Rail Transit Extensions Program (MTC Resolution No. 1876) includes an extension of CalTrain from its current San Francisco terminus at 4th and Townsend Streets to the central downtown area. The Peninsula Corridor Joint Powers Board, the entity owning CalTrain, is currently (1995) preparing a DEIS/DEIR for this extension. The patronage forecasts for the BART–San Francisco Airport Extension build alternatives with and without the CalTrain Downtown Extension were presented in the *Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report* (AA/DEIS/DEIR) published by MTC in 1992. The assumptions used by the MTC in the travel demand modeling for the BART build alternatives with and without the CalTrain Downtown Extension were held constant for the analysis of the BART build alternatives in the DEIR/SDEIS.

Estimates have been made of transit boardings on the Alternative VI Aerial Design Option and CalTrain with the proposed CalTrain Downtown Extension. These estimates are based on the patronage forecasts for Alternatives 3A and 3B, as described in the AA/DEIS/DEIR. Alternative 3A is a BART build alternative (the Base Case Alternative in the DEIR/SDEIS) without the proposed CalTrain extension to downtown San Francisco, whereas Alternative 3B is the Base Case Alternative plus the CalTrain Downtown Extension.

In the following discussion, BART boardings without the CalTrain Downtown Extension are compared to boardings with CalTrain extension. BART boardings of 399,500 under Alternative 3A (without the CalTrain extension) decline by 4 percent to 383,700 under Alternative 3B (with the extension). Assuming a similar relationship for the Aerial Design Option under Option B, BART boardings would decline by an identical 4 percent, from 401,500 without the CalTrain Downtown Extension to 385,600 boardings with the CalTrain Downtown Extension in 2010. This same method of deriving boardings with and without the CalTrain Downtown Extension applies to Option X and CalTrain. Under the Aerial Design Option, CalTrain boardings would increase by 24 percent from 46,700 without the downtown extension to 57,800 with the downtown extension in 2010. This percentage change in CalTrain boardings is identical to that found between Alternative 3A and Alternative 3B in the AA/DEIS/DEIR. The consistency between the project definitions and modeling assumptions for the Base Case Alternative in the AA/DEIS/DEIR and the DEIR/SDEIS allowed the use of ratios as a reasonable approach to approximate patronage changes with the CalTrain Downtown Extension.

Table 3.1-3 shows the daily transit boardings at each BART station in San Mateo County for the Aerial Design Option. Further details on trip type and access mode are contained in Appendix Table A. Although the study area for the FRDEIR/S#2DEIS includes only the Airport International Terminal Station and the Millbrae Avenue Station, information regarding other BART stations in San Mateo County is included to allow comparisons of the Aerial Design Option with other alternatives evaluated in the DEIR/SDEIS.

3. *Regional transit ridership, particularly for trips originating in or destined for northern San Mateo County, would increase with the Alternative VI Aerial Design Option. (B)*

Table 3.1-4 shows total transit person trips for the nine-county Bay Area region for the Aerial Design Option (either Option B or X). A comparison of this regional transit total to transit ridership

**Table 3.1-3
BART Daily Patronage By Station (1)**

STATION	1993 NO BUILD	1993 (2) ALT VI TUNNEL	1993 (2) DESIGN OPTION B	1993 (2) DESIGN OPTION X
Daly City	12,500	11,900	11,900	11,900
Colma	N/A	14,600	14,600	14,600
Subtotal	12,500	26,500	26,500	26,500
Hickey	N/A	7,200	7,200	7,200
Tanforan	N/A	8,500	8,500	8,500
Airport International Terminal	N/A	12,000	11,600	11,500
Millbrae Avenue	N/A	29,200	28,900	28,900
Subtotal	N/A	56,900	56,200	56,100
TOTAL	12,500	83,400	82,700	82,600
	1998 NO BUILD	1998 ALT VI TUNNEL	1998 DESIGN OPTION B	1998 DESIGN OPTION X
Daly City	12,800	12,600	12,600	12,600
Colma	32,700	15,400	15,400	15,400
Subtotal	45,500	28,000	28,000	28,000
Hickey	N/A	7,600	7,600	7,600
Tanforan	N/A	9,100	9,100	9,100
Airport International Terminal	N/A	15,100	14,500	14,400
Millbrae Avenue	N/A	31,200	30,900	30,900
Subtotal	N/A	63,000	62,100	62,000
TOTAL	45,500	91,000	90,100	90,000
	2010 NO BUILD	2010 ALT VI TUNNEL	2010 DESIGN OPTION B	2010 DESIGN OPTION X
Daly City	13,600	13,300	13,300	13,300
Colma	35,200	16,200	16,200	16,200
Subtotal	48,800	29,500	29,500	29,500
Hickey	N/A	8,000	8,000	8,000
Tanforan	N/A	9,800	9,800	9,800
Airport International Terminal	N/A	18,700	18,000	17,800
Millbrae Avenue	N/A	33,400	33,100	33,000
Subtotal	N/A	69,900	68,900	68,600
TOTAL	48,800	99,400	98,400	98,100

Source: See Appendix Table A.

- 1) Patronage is defined as the number of entrances and exits at a particular station.
- 2) Analysis of 1993 Build Alternatives assumes the project is implemented in the baseline year (even though the actual opening year is 1998) and is provided as a means of measuring impacts due solely to the project without influences from general growth or other changes.

Table 3.1-4
Alternative VI Aerial Design Option
Regional Transit Person Trips (Linked Trips) (1)(2)
Daily Volumes by Trip Purpose and Year

	1993		1998		2010	
	Option B	Option X	Option B	Option X	Option B	Option X
Work Trips	515,200	515,200	561,600	561,600	604,100	604,100
Non-Work Trips	<u>587,300</u>	<u>587,200</u>	<u>640,300</u>	<u>640,200</u>	<u>691,100</u>	<u>691,000</u>
TOTAL	1,102,500	1,102,400	1,201,900	1,201,800	1,295,200	1,295,100
Change From Alt. I - No Build (3)	61,800	61,700	20,500	20,400	23,300	23,200
Change From Alt. VI (3)	(100)	(200)	(100)	(200)	(100)	(200)

Sources: MTC, BART-SFO AA/DEIS/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO DEIR Patronage Forecasts, October 1993
Parsons Brinckerhoff, July 1995

- 1) The region is defined as the nine-county Bay Area region, including the counties of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Marin, Sonoma, Napa, and Solano.
- 2) Linked trips may involve the use of one or more transit systems, but the total trip from origin to destination is counted as one transit trip.
- 3) For 1993, the No Build Alternative does not include a BART extension to Colma. For 1998 and 2010, the No Build Alternative includes the Colma extension.

under the No Build Alternative in the same analysis year indicates that the Aerial Design Option would increase regional transit ridership. Regional transit person trips would decrease by 100 under Option B and by 200 under Option X compared to Alternative VI. The decline in these linked transit trips is less than the decline in BART boardings because riders would still be using mass transit, but some individuals would no longer transfer to BART under either Option B or X compared to Alternative VI.

Table 3.1-5 shows daily trips to the SFIA by mode and indicates a significant shift to rail transit (from bus and automobile use) compared to the No Build Alternative. Increased transit usage would reduce auto congestion and air pollution. In 1998, the percentage of transit riders destined to the SFIA would increase from 8.9 percent to 14.1 percent; to northern San Mateo County, from 7.0 percent to 9.5 percent; and to downtown San Francisco, from 34.8 percent to 40.8 percent. Rail access into the SFIA would decrease by 700 under Option B and by 900 under Option X compared to Alternative VI, with a corresponding increase in bus and auto trips.

Table 3.1-5
Alternative VI Aerial Design Option
Daily Trips by Mode
to the San Francisco International Airport

Transit System	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
<u>AIR PASSENGERS (1)</u>						
BART	5,000	5,000	5,900	5,800	7,300	7,200
CalTrain (2)	2,200	2,200	2,600	2,600	3,200	3,200
Bus	10,100	10,200	11,900	12,000	14,700	14,800
Auto	85,400	85,400	100,300	100,300	123,800	123,800
TOTAL	102,700	102,800	120,700	120,700	149,000	149,000
<u>WORK AND OTHER</u>						
BART	3,200	3,100	4,400	4,300	5,500	5,400
CalTrain (2)	1,200	1,200	1,700	1,600	2,100	2,000
Bus	500	500	600	600	800	800
Auto	46,000	46,000	63,800	63,800	79,400	79,500
TOTAL	50,900	50,800	70,500	70,300	87,800	87,700
<u>TOTAL SFIA TRIPS</u>						
BART	8,200	8,100	10,300	10,100	12,800	12,600
CalTrain (2)	3,400	3,400	4,300	4,200	5,300	5,200
Bus	10,600	10,700	12,500	12,600	15,500	15,600
Auto	131,400	131,400	164,100	164,100	203,200	203,300
TOTAL	153,600	153,600	191,200	191,000	236,800	236,700
<u>Change From Alternative I (No Build)</u>						
	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
<u>TOTAL SFIA TRIPS</u>						
BART	8,200	8,100	10,300	10,100	12,800	12,600
CalTrain (2)	3,000	3,000	3,700	3,600	4,600	4,500
Bus	(4,400)	(4,300)	(5,700)	(5,600)	(7,100)	(7,000)
Auto	(6,800)	(6,800)	(8,200)	(8,200)	(10,200)	(10,100)
<u>Change From Alternative VI (Tunnel)</u>						
	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
<u>TOTAL SFIA TRIPS</u>						
BART	(300)	(400)	(500)	(700)	(500)	(700)
CalTrain (2)	(100)	(100)	(100)	(200)	(100)	(200)
Bus	400	500	400	500	600	700
Auto	0	0	100	100	100	200

Source: MTC, BART-SFO A/DEIS/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO DEIR/SDEIS Patronage Forecasts, October 1993
Parsons Brinckerhoff, July 1995

- 1) Air passengers includes visitors and greeters as well as air passengers.
- 2) CalTrain riders to SFIA are required to transfer to BART. These CalTrain trips are included only under CalTrain and are not also included in the number of BART trips to SFIA.

4. *Under the Alternative VI Aerial Design Option, regional transit transfers that are required to complete the trip from origin to destination would be the same as under the No Build Alternative. Important new transfer opportunities between BART-CalTrain and BART-ALRS would be created. (B)*

Table 3.1-6 shows the average number of transfers required for all transit trip-making in the region with the Aerial Design Option. New transfer opportunities would occur with the BART-San Francisco Airport Extension between BART and CalTrain at the Millbrae Avenue Station that otherwise would not be available. The BART alignment into the SFIA would create a transfer opportunity between BART and the ALRS at the Airport International Terminal Station. Transfers between CalTrain and the ALRS would require the intermediate use of BART.

Table 3.1-7 shows the transfer volumes projected at these stations. These transfer opportunities are a beneficial effect of the Aerial Design Option (either Option B or X) because of the unavailability of these transfers under the No Build Alternative. Intermodal transfers would slightly decrease under the Aerial Design Option compared to Alternative VI due to the small reduction in trips on BART to the SFIA. For example, transfers between BART and CalTrain under Option B in 2010 would decrease by 200 compared to Alternative VI because 200 fewer CalTrain riders go to the SFIA on BART under this design option than under Alternative VI.

Using the method to estimate boardings with the proposed CalTrain Downtown Extension described above under Impact 2, estimates were also made of the number of BART and CalTrain intermodal transfers with the CalTrain Downtown Extension. For example, the BART-ALRS transfers under Alternative 3A are forecast at 13,900 in the year 2010 and at 13,300 transfers under Alternative 3B, an approximate 4 percent reduction in transfers with the CalTrain Downtown Extension. Accordingly, the 7,700 transfers forecast under the Aerial Design Option without the CalTrain Downtown Extension in the current DEIR/SDEIS would be reduced by 4 percent to 7,400 transfers with the CalTrain Downtown Extension.

An exception to this method of factoring based on Alternative 3A and 3B in the AA/DEIS/DEIR was made for the BART-CalTrain transfers under the Aerial Design Option. The CalTrain Downtown Extension would affect transit patronage to and from downtown San Francisco, but it would not affect the number of CalTrain riders in San Mateo County going into and out of the SFIA. Under the Aerial Design Option, in 2010, 5,200 CalTrain riders from south of the SFIA are estimated to travel to and from the SFIA, with BART providing the only direct rail access to the SFIA. These riders were subtracted from the 24,200 transfers between BART and CalTrain under the Aerial Design Option before the factoring was applied, because the CalTrain Downtown Extension would not affect their destination choice of the SFIA. Once the factoring was performed, these 5,200 CalTrain riders were added back to the number of transfers between BART and CalTrain to arrive at the 11,800 transfers under the Alternative VI Aerial Design Option with the CalTrain Downtown Extension.

5. *Of all the BART build alternatives, walking distance to SFIA airline terminals from BART would be shortest under the Aerial Design Option. (B)*

Table 3.1-6
Alternative VI Aerial Design Option
Regional Transit Boardings and Transfers (1)
Daily Volumes By Year

	1993 Design Option B	1993 Design Option X	1998 Design Option B	1998 Design Option X	2010 Design Option B	2010 Design Option X
Total Transit Boardings	1,656,300	1,656,200	1,901,100	1,901,000	2,127,100	2,127,000
Change From Alt. I - No-Build	84,400	1,656,200	25,500	25,400	28,500	28,400
Change From Alt. VI	0	(100)	(100)	(200)	(100)	(200)
Transfers Per Transit Person Trip (2)	0.502	0.502	0.582	0.582	0.642	0.642
Change From Alt. I - No-Build	(0.008)	(0.008)	(0.007)	(0.006)	(0.008)	(0.008)
Change From Alt. VI	0.000	0.000	0.000	0.000	0.000	0.000

Source: MTC, BART-SFO AA/DEIS/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO DEIR/SDEIS Patronage Forecasts, October 1993
Parsons Brinckerhoff, July 1995

- 1) The region is defined as the 9-county Bay Area region, including the counties of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Marin, Sonoma, Napa, and Solano.
- 2) Total transit boardings divided by regional transit person trips from Table 3.1-4

**Table 3.1-7
Daily Intermodal Transfers
Between Rail Services**

Weekday Transfers Between Operators	1993			1998			2010		
	Alt. VI	Option B	Option X	Alt. VI	Option B	Option X	Alt. VI	Option B	Option X
BART-CalTrain w/o CalTrain Ext.	19,700	19,500	19,400	22,000	21,800	21,700	24,400	24,200	24,100
BART-CalTrain w/ CalTrain Ext. ⁽¹⁾	10,200	10,100	10,100	11,100	10,900	10,900	12,000	11,800	11,800
BART-ALRS w/o CalTrain Ext. ⁽²⁾	5,100	4,900	4,900	6,500	6,300	6,300	8,000	7,700	7,700
BART-ALRS w/ CalTrain Ext. ⁽¹⁾⁽²⁾	4,900	4,700	4,700	6,200	6,000	6,000	7,700	7,400	7,400
CalTrain-ALRS ⁽³⁾	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Sources: MTC, BART-SFO AA/DEIS/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO DEIR/SDEIS Patronage Forecasts, October 1993
Parsons Brinckerhoff, July 1995

- 1) These transfer estimates are not from MTC's regional model but rather are based on changes in transfers under the Base Case Alternative and the 1992 LPA with and without the CalTrain Downtown Extension, as forecast in the AA/DEIS/DEIR.
- 2) BART-ALRS transfers do not include individuals who walk between BART and their airport destinations.
- 3) These transfers require an intermediate transfer to BART and are included in the BART-CalTrain volumes.

Both Options B and X would include a BART station on SFIA property where air passengers could walk to the most frequently used terminals, with the option to transfer to the ALRS which would be close to the BART station. The mid-point of the BART station platform under Option B would be within 320 feet of the nearest airline ticketing counter at the planned International Terminal and within 420 feet of the nearest counter at the North Terminal. Under Option X, the distances from the mid-point of the platform to the nearest counters at the planned International Terminal and the North Terminal are 760 feet and 1,400 feet, respectively. These distances from the platform to the same points at the planned International Terminal and the North Terminal are 740 feet and 1,250 feet, respectively, under Alternative VI. Option B is on the same level as the ALRS, whereas Option X would be on the departure level which is one level below the ALRS, and Alternative VI is four levels below the departure level of the airport.

1.3 TRAFFIC IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The significance criteria and methodology used to determine and assess traffic impacts of the Alternative VI Aerial Design Option are presented in Chapter 3, Section 1.2, of the DEIR/SDEIS.

Project-Specific Analysis

The freeway traffic impacts under the Aerial Design Option (Option B and X) are the same as those presented for Alternative VI in Chapter 3, Section 1.2 of the DEIR/SDEIS. Significant adverse traffic impacts to local intersections under the Aerial Design Option (either Option B or X) would also be the same as those defined for Alternative VI in Chapter 3, Section 1.2 of the DEIR/SDEIS, except as noted below. The results of the intersection operations analysis for the Alternative VI Aerial Design Option are presented in Appendix B.

1. *The new circulation system at the Millbrae Avenue Station would increase traffic volume at the Broadway/Rollins/Highway 101 off-ramp intersection, but the intersection level of service would remain acceptable. (I)*

The Millbrae Avenue Station under the Aerial Design Option (both Options B and X) includes a new road connecting the BART parking garage and surface lot to Adrian Road. This new, one-way southbound roadway would serve as an exit from the station to Adrian Road and then to Rollins Road. The intersection of Rollins/Adrian would be signalized, and the level of service at this intersection in 2010 is projected at LOS A during both the A.M. and P.M. peak hours. This signal would require coordination with the signal at the Millbrae/Rollins intersection. With the Adrian Road connection, some drivers destined for southbound Highway 101 may turn south onto Rollins Road and enter Highway 101 at the Broadway interchange rather than at the Millbrae Avenue interchange. The LOS at the intersection of Broadway/Rollins/Highway 101 off-ramp would be LOS C during the A.M. and P.M. peak hours in 2010 under the Aerial Design Option. Under the No Build Alternative in 2010, this intersection would be at LOS B during the A.M. peak hour and LOS C during the P.M. peak hour; under Alternative VI, the intersection would be at LOS C during both peak hours. Thus, the Aerial Design Option would not change the LOS, compared to Alternative VI.

The new traffic circulation system at the Millbrae Avenue Station would improve bus circulation to the station compared to Alternative VI. Under the Aerial Design Option, a central plaza to the east of the station would be designed with an elongated oval for buses to circle in front of the station. Under Alternative VI, the buses had to circle the station garage to access and then depart the bus bays for the station which is a longer distance and involves greater travel time than under the Aerial Design Option.

2. *As with Alternative VI, the Aerial Design Option is forecast to have an adverse impact at one existing intersection in the transportation study area during the A.M. peak hour relative to the No Build Alternative. (S)*

The LOS in the 1998 and 2010 A.M. peak hour at the El Camino Real/Millbrae intersection is projected to degrade from LOS D under the No Build Alternative to LOS E in both years under the Aerial Design Option (both Options B and X).

MITIGATION MEASURES. A potential improvement to increase traffic capacity at this intersection to address BART's contribution to predicted impacts would be to widen the east leg of Millbrae Avenue to create an additional eastbound through lane. This plan would involve land and a business acquisition, as well as retrofitting the Millbrae Avenue overpass for which construction began in summer 1995. The following mitigation measure based on this possible improvement is proposed to address the impacts at the intersection of El Camino Real/Millbrae. This same measure also applies to Alternative VI. The impact would remain significant and unavoidable until such time as the proposed improvements are constructed.

- 2.1 *Fair Share Contribution to Future Intersection Improvement.* In the future, BART would contribute its fair share to the cost of improvements at the intersection of El Camino Real/Millbrae. This contribution would be based on the cost of widening Millbrae Avenue to create an additional eastbound through lane, and it would be implemented providing the improvement were made within a reasonable amount of time. An example of such improvements is the City of Millbrae's proposed extension of California Avenue to an extended Victoria Avenue with a new BART garage.

Cumulative Analysis

Cumulative impacts with the Alternative VI Aerial Design Option (either Option B or X) are identical to those discussed under Alternative VI in Chapter 3, Section 1.2, of the DEIR/SDEIS. The discussion below presents the cumulative traffic impacts associated with the Millbrae Avenue Interchange with Highway 101, the CalTrain Downtown Extension, and the BART–San Francisco Airport Extension.

Freeway

3. *A significant cumulative impact with Alternative VI or the Aerial Design Option would be a worsening of traffic flow on the weaving segment of the northbound collector road between the northbound loop on-ramp from Millbrae Avenue to Highway 101 and the northbound loop off-ramp from Highway 101 to Millbrae Avenue.*

The level of service under the No Build Alternative in 2010 for the weaving segment between the northbound loop on-ramp and the loop off-ramp would be LOS F during the A.M. peak hour. Under Alternative VI as well as the Aerial Design Option, approximately 500 vehicles would be added to the northbound loop on-ramp in 2010. This increment of traffic would have a significant cumulative impact on operations of the weaving segment between these two loop ramps.

MITIGATION MEASURES. One method to mitigate this impact is to change the Millbrae Avenue interchange with Highway 101 to a Par-Clo design. The partial cloverleaf (Par-Clo) design would eliminate the loop off-ramps from Highway 101 to Millbrae Avenue. Northbound vehicles accessing the Millbrae Avenue BART Station would be required to use the diagonal off-ramp and turn left at a new traffic signal, if such a design were to be implemented. This proposal is

recommended as a mitigation measure and would reduce the cumulative impact from the BART–San Francisco Airport Extension and background traffic to an insignificant level.

3.1 *Fair Share Contribution to Future Millbrae Avenue Interchange to Highway 101 Improvements.* The loop off-ramp from northbound Highway 101 to westbound Millbrae Avenue would be closed to vehicles exiting Highway 101, as indicated in Figure 3.1-1. Northbound vehicles on Highway 101 traveling westbound on Millbrae Avenue would exit on the diagonal off-ramp from Highway 101. This northbound diagonal off-ramp from Highway 101 would be reconfigured to a signalized intersection with Millbrae Avenue where vehicles would turn left to travel west or turn right to travel east. The closure of the loop off-ramp would eliminate the conflicting weave movement with traffic from the northbound loop on-ramp. This highway interchange is in the purview of Caltrans. If Caltrans, in concert with the City of Millbrae or others, were to decide to undertake this project, then BART would contribute its fair share to the cost of these improvements based on the direct project impact.

4. *No additional significant cumulative impacts on freeway segments would occur under the Alternative VI Aerial Design Option with the addition of the CalTrain Downtown Extension. (I)*

Based on analysis performed in the AA/DEIS/DEIR, traffic volumes on freeway segments both north and south of the SFIA would be slightly less with the addition of the CalTrain Downtown Extension to the BART–San Francisco Airport Extension.

Intersections

5. *With the CalTrain Downtown Extension added to the Aerial Design Option, no additional significant cumulative impacts to local intersections would occur. (I)*

According to the analysis performed in the AA/DEIS/DEIR, traffic volumes during the P.M. peak hour in 2010 would not significantly affect the LOS at intersections in the vicinity of the CalTrain stations within the study area. The traffic volumes during the P.M. peak hour at the Airport Intermodal Station would decline from 1,385 vehicle trips under Alternative 3A (without the CalTrain Downtown Extension) to 935 under Alternative 3B (with the CalTrain Downtown Extension). Information in the AA/DEIS/DEIR provides the change in vehicle trips with and without the CalTrain Downtown Extension for patrons using BART or CalTrain stations between Daly City and Millbrae. Vehicle trips to and from these BART stations decrease by 1,700 in 2010 when comparing Alternative 3A to Alternative 3B; whereas vehicle trips to CalTrain stations in South San Francisco, San Bruno, and Millbrae increase by 100 vehicle trips in the same comparison. Based on a review of the AA/DEIS/DEIR and the transportation impacts under the Aerial Design Option, a decline in vehicle trips would occur at the Millbrae Avenue Station under the Alternative VI Aerial Design Option if the CalTrain Downtown Extension were also built; the Millbrae Avenue Station functions as an end-of-the-line station, similar to the Airport Intermodal Station Alternative 3B.

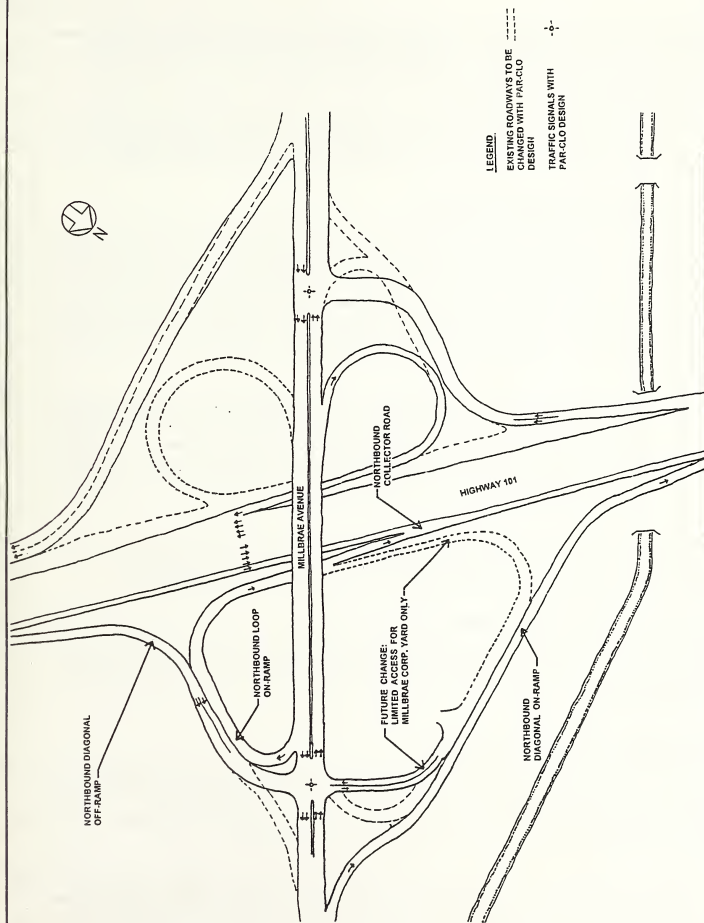
Changes in traffic volumes during the A.M. peak hour in 2010, when traffic volumes are predicted to be the greatest of the three analysis years, would be the same order of magnitude as changes indicated for the P.M. peak hour.

An Example of a Par-Clo Design for Millbrae Avenue Interchange of Highway 101

3.1-1

FIGURE

3.1-15



1.4 PARKING IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The significance criteria and methodology used to determine and assess parking impacts of the Alternative VI Aerial Design Option are presented in Chapter 3, Section 1.2, of the DEIR/SDEIS.

Project-Specific and Cumulative Analyses

Project-specific and cumulative parking impacts for the Aerial Design Option are identical to those described under Alternative VI in Chapter 3, Section 1.2, of the DEIR/SDEIS. An additional measure has been formulated, however, to address spillover parking and is presented for the Aerial Design Option. This measure would also apply to Alternative VI. The same mitigation measure recommended for this impact under Alternative VI, i.e., a residential permit parking program, would apply to the Aerial Design Option. This measure in combination with that identified below would reduce this impact to an insignificant level.

- 1.1 *Parking Meters or Restricted Parking Zones.* On commercial streets, parking meters or restricted parking zones implemented by the City of Millbrae would discourage BART patrons from parking all day on city streets in the vicinity of the Millbrae Avenue Station. Meters or parking zones would encourage turnover and make curb parking available to patrons of local businesses. Implementation of this measure would not have significant environmental effects.

1.5 PEDESTRIAN, BICYCLE AND FREIGHT IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The significance criteria and methodology used to determine and assess pedestrian, bicycle, and freight transportation impacts of the Alternative VI Aerial Design Option are presented in Chapter 3, Section 1.2, of the DEIR/SDEIS.

Project-Specific and Cumulative Analyses

The impacts related to bicycle, and freight transportation for the Alternative VI Aerial Design Option are the same as described under Alternative VI in Chapter 3, Section 1.2, of the DEIR/SDEIS. There would, however, be a significant reduction in pedestrian volumes at the Airport International Terminal Station under the Aerial Design Option compared to Alternative VI as presented below.

1. *Under the Alternative VI Aerial Design Option (either Option B or X), pedestrian volumes would increase around the new Airport International Terminal and the Millbrae Avenue BART Stations. The projected number of peak-hour station entries and exits would not be high enough to cause a significant impact on pedestrian activity. (1)*

Pedestrian volumes at the Airport International Terminal Station are estimated at 1,050 under Option B and 1,042 pedestrians under Option X during the P.M. peak hour in 2010. At the Millbrae Avenue Station, the volume would be relatively low, at 277 pedestrians under both options during the P.M. peak hour in 2010. These volumes would not impede existing pedestrian activity or contribute substantially to sidewalk congestion. The high volume at the Airport International Terminal Station would be accommodated by the terminal's design. There would be no negative impacts associated with these pedestrian volumes.

Section 2

Land Use and Economic Activity

2.1 EXISTING CONDITIONS

Existing conditions information regarding land use, general plan policies, and economic activities is presented in Chapter 3, Section 2.1, of the DEIR/SDEIS.

2.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The significance criteria and methodology used to determine and assess land use and economic impacts of the Aerial Design Option are the same as those for all other project alternatives and design options. These criteria and the impact assessment methodology are presented in Chapter 3, Section 2.2, of the DEIR/SDEIS. Specific impacts considered by this discussion include land use compatibility, conformance with local economic programs, consistency with local general plan policies, land acquisition and displacement, community cohesion/social disruption, and regional economic growth.

Project-Specific Analysis

The land use and economic impacts of the Aerial Design Option are virtually the same as those identified for Alternative VI in Chapter 3, Section 2.2, of the DEIR/SDEIS. The differences include:

- acquisition of easements for the tunnel alignment under Alternative VI Tunnel would not be required but acquisition of right-of-way would be required along the mainline;
- the aerial wye-stub under both Options B and X would require easements and fee acquisition of SFIA property but would not involve any displacement because the alignment would pass over vacant SFIA land or pass over streets and surface parking areas at the SFIA; and
- the new station concept at the Millbrae Avenue Station would involve acquisition of a different set of businesses than identified for Alternative VI Tunnel.

A final Relocation Impact Study will be prepared, as discussed in Chapter 3.2 of the DEIR/SDEIS, and will be included in the Final EIR/EIS. The study will provide the basis for determining assistance and payments to all displaced households and businesses in accordance with federal and state relocation laws.

Mainline through San Bruno, Millbrae, and Burlingame

1. *The BART mainline and auxiliary track would require the acquisition of right-of-way but would not involve any displacement of structures or existing uses. (1)*

The BART mainline and auxiliary track would require the acquisition of land from the Joint Powers Board, the SFIA and SFWD, along the existing CalTrain mainline. There are no existing uses or structures that would be displaced, so that the impacts of this land acquisition would be insignificant.

2. *The Millbrae Avenue Station would require land acquisition affecting 20 to 25 employees (see Figure 3.2-1). However, the number of displaced employees would be less than Alternative VI Tunnel because the acquisition of one gas station would not occur.(S)*

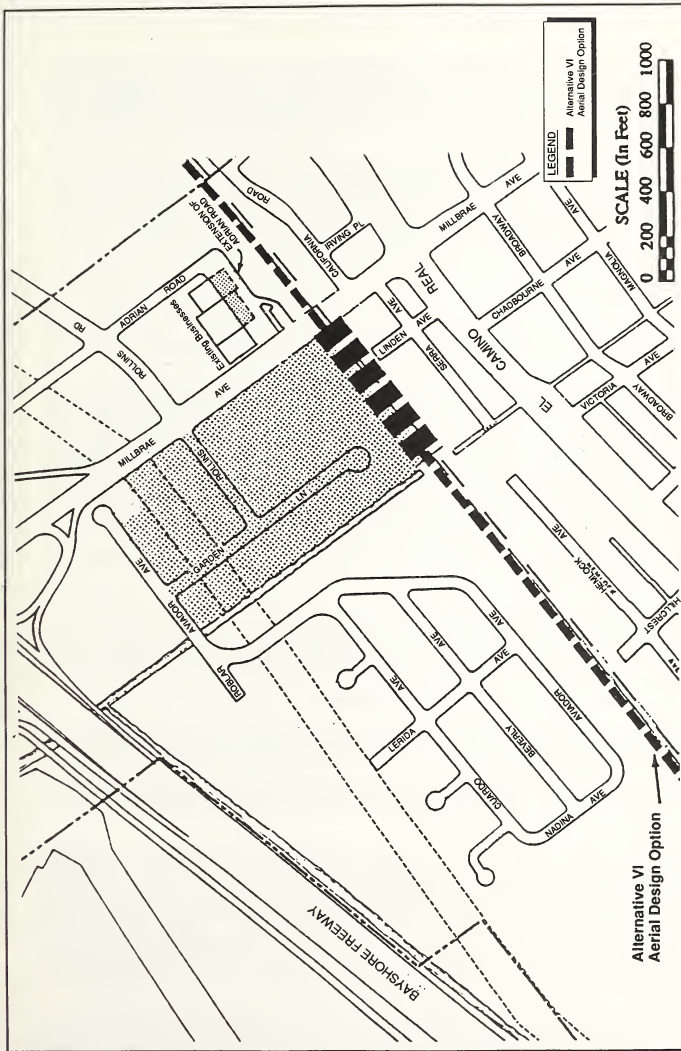
As part of the Aerial Design Option, the Millbrae Avenue Station has been redesigned to improve operations and circulation at the station. Two particular changes would result in a different number of business displacements than were identified for Alternative VI Tunnel in Chapter 3, Section 2.2, of the DEIR/SDEIS. The first change would alter the overall station footprint, or the land area to be used for station facilities. This change would result in the preservation of a gas station along Millbrae Avenue that would have been acquired under Alternative VI Tunnel. The second change would provide for a new road to serve vehicles leaving the station parking structure in the P.M. peak hour. The road would link the garage with Adrian Road. The proposed alignment for this road would affect two warehousing businesses immediately south of Millbrae Avenue between Rollins Avenue and the CalTrain mainline. The net effect of the modified station layout is a reduction in the number of displaced employees, compared to Alternative VI Tunnel:

- the Millbrae Avenue Station layout would require acquisition of the Hertz rental car lot on Millbrae Avenue (this would also occur under Alternative VI Tunnel), resulting in the displacement of 10 to 15 employees; and
- the revised circulation system at the Millbrae Avenue Station would require partial acquisition of two lots occupied by warehousing businesses, affecting 10,000 square feet and 5 to 10 employees.

In summary, the Millbrae Avenue Station under the Aerial Design Option would result in the displacement of 20 to 25 employees. This job loss is less than under Alternative VI Tunnel because the job loss resulting from acquisition of the gas station under Alternative VI Tunnel would not occur.

MITIGATION MEASURES. The same mitigation measure to address displacement as recommended for Alternative VI Tunnel would apply to the Aerial Design Option. This measure which calls for compliance with federal and state acquisition and relocation laws would reduce the economic impact to an insignificant level.

3. *The proposed layout of the Millbrae Avenue Station is consistent with the Millbrae Avenue Station Area Concept Plan adopted by the City of Millbrae and supports the City's efforts to encourage future joint use and economic development opportunities around the station.*



FIGURE

Displacement at the Millbrae Avenue Station

3.2-1

The proposed layout for the Millbrae Avenue Station under the Aerial Design Option includes several basic changes from that proposed under Alternative VI Tunnel. Most notable are the relocation of the parking garage away from the Millbrae Avenue frontage, the provision of another road connection that would alleviate the use of the Millbrae/Rollins intersection, and addition of a bus plaza internal to the station. Each of these proposed refinements to the station layout is consistent with the City of Millbrae's adopted Millbrae Avenue Station Area Concept Plan. Part of the city's objectives in adopting the concept plan was to stimulate economic development opportunities around the station. The modifications to the station design as proposed under the Aerial Design Option support a portion of the city's land use and economic objectives.

Aerial Wye-Stub to the SFIA

4. *The BART aerial alignment from San Bruno to the SFIA and from the SFIA to Millbrae would require acquisition of right-of-way but would not involve any displacement of existing structures or uses. (I)*

The aerial wye-stub would pass over vacant SFIA land west of Highway 101 and over roads and surface parking lots east of Highway 101. The area east of Highway 101 through which the BART "trace" would traverse is a narrow corridor with airfreight, nonterminal aviation support, and aircraft maintenance to the north (these are lands leased to United Airlines) and airport support to the south (these are lands leased to Hertz, Dollar, Budget, and Avis rental car agencies). Neither Option B nor X would involve the displacement of existing uses. Accordingly, the effects of purchasing the necessary right-of-way for the Aerial Design Option would not be significant.

5. *The aerial Airport International Terminal Station would affect improvements proposed as part of the SFIA Master Plan. (I)*

The Aerial Design Option would involve an aerial station on the east side of Highway 101 in the vicinity of the planned International Terminal and Ground Transportation Center/Rental Car Garage (GTC/RCG). The SFIA Master Plan does not provide for a BART station on the east side of Highway 101 and thus the BART proposal under the Aerial Design Option, as well as under Alternative VI Tunnel, would affect the SFIA Master Plan.

The 1989 SFIA Master Plan outlines a number of infrastructure improvements to be implemented by the year 2006 to accommodate projected growth at the airport. Key improvements that would affect either the construction or operation of the Aerial Design Option east of the western edge of Highway 101 include the construction of an International Terminal, the GTC/RCG, the ALRS, and new highway ramps into an out of the airport.

Option B includes a BART station at the planned International Terminal adjacent to the ALRS station that is one level above the departures hall. The North Shoulder Building of the planned International Terminal would require the following four modifications to accommodate the BART station. First, the width of the proposed slot in the planned International Terminal needed for the ALRS must be expanded from a width of 80 feet to 124 feet to accommodate both the ALRS and BART. Second, additional structural support must be designed to integrate the BART alignment with the ALRS. Third, new space must be added to the three levels of the planned International

Terminal to minimize any loss of functional space to and from the boarding gates as well as to provide area for BART fare collection and escalators to the BART platform. Finally, additional structural supports must be provided over a service courtyard and over one end of the North Terminal for the BART tailtracks.

These modifications would have cost impacts on the SFIA's International Terminal project. The SFIA Master Plan schedule can be maintained through the use of standard contracting practices possible during construction, e.g., conventional bid addenda, change orders and construction block outs. By integrating the design of the BART guideway and station structures that are east of Highway 101 with those of the ALRS, the functional and operational impacts to the SFIA Master Plan would be minimized. By making the design and construction of the BART guideway over Highway 101 compatible with construction of SFIA's new freeway ramps, the impacts to the SFIA Master Plan would also be minimized.

Option X includes the BART station at the same level as the departure hall of the planned International Terminal and one level below the ALRS. The following modifications to the architectural designs of the SFIA Master Plan would be required to implement Design Option X. Minimal modifications would be required to the west facade of the North Shoulder Building of the planned International Terminal. Requirements of a BART station must be incorporated into the planned International Terminal including a new plaza for BART fare gates and station entry, increased space for escalators and stairs as well as pedestrian capacity between the planned International Terminal and the North Terminal. Minor alignment shifts to the ALRS would be required to integrate the structural support for BART platforms and the ALRS station at the GTC/RCG. The plans for the RCG may change as staff of the SFIA reassesses the function and capacity of this facility given possible changes under Option X. The impacts to the construction schedule of the SFIA Master Plan projects would be nominal under Option X.

Both Options B and X may interfere with future design and construction of a proposed new office and five-level parking structure on existing lots C and CC, immediately west of the proposed GTC. Construction of the office and parking structure is part of the long-term plan targeted for 2006. Near-term plans, on the other hand, are targeted for 1996.

6. *Implementation of Mitigation Measure 1.3, i.e., creation and enhancement of wetland habitats onsite of the west of Bayshore parcel, recommended in Section 7, Biological Resources, the community garden located adjacent to Lion's Field Park in San Bruno would be displaced. (S)*

MITIGATION MEASURES. The only measure available to reduce this impact to an insignificant level would be to select another optional site for wetlands creation.

Cumulative Analysis

The cumulative land use and economic impacts of the Alternative VI Aerial Design Option are the same as those presented for Alternative VI in Chapter 3, Section 2.2, of the DEIR/SDEIS.

Section 3

Visual Quality

3.1 EXISTING CONDITIONS

A description of the existing visual setting can be found in Chapter 3, Section 3.1, of the DEIR/SDEIS.

3.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and evaluate the significance of visual impacts resulting from the Alternative VI Aerial Design Option are described in Chapter 3, Section 3.2, of the DEIR/SDEIS.

Project-Specific Analysis

Visual impacts of the Aerial Design Option would be the same as those described for Alternative VI in Chapter 3, Section 3.2, of the DEIR/SDEIS, with the following exceptions:

- The discussion of impacts associated with the tunnel portion of the alignment on SFIA property, none of which were significant, would not apply since the alignment would be in aerial instead of tunnel configuration; and
- Visual encroachment effects on the Bayside Manor and Millbrae Manor neighborhoods would not occur since the alignment would be in cut-and-cover subway instead of at grade.

The location of some BART ancillary facilities, such as the traction power substation and train control bungalow at the Millbrae Avenue Station, would change under the Aerial Design Option. However, these structures would not result in new significant impacts, as explained below.

In addition, new visual effects would occur due to the sound wall in San Bruno, Millbrae, and Burlingame and the aerial guideways across SFIA property. These new impacts are described below.

Mainline through San Bruno, Millbrae, and Burlingame

1. *Between a point approximately 400 feet north of San Felipe Avenue in San Bruno and approximately 300 feet north of Madrone Street in Millbrae, a landscaped sound wall proposed as*

part of the Aerial Design Option would alter the visual setting for Lomita Park residents but would not obstruct significant views or detract from scenic resources. (I)

In order to reduce potential noise impacts to residents along Huntington and San Antonio Avenues, the Alternative VI Aerial Design Option includes a sound wall along the western edge of the BART/CalTrain mainline right-of-way. The sound wall would vary in height depending on potential noise impacts. As noted in Section 3.9, Noise and Vibration, the height of the wall is proposed to be 15 feet, except along the Airport Park neighborhood in Millbrae where a height of 20 feet has been recommended to mitigate noise impacts. The wall would not result in visual disturbance or obstruct significant views of the open space area at the SFIA west of Bayshore parcel. Views of this area are largely screened now by the eucalyptus trees and in the future would be screened by the sound wall, resulting in no net change in terms of views of the open space area. The wall would alter the streetscape, however, and close-up views (see Impact 2, below). The placement and height of the sound wall would have the beneficial effect of blocking views of the at-grade alignment and the proposed car wash.

2. *Loss of scenic resources and changes to the streetscape along Huntington and San Antonio Avenues due to a sound wall would be offset by proposed landscaping. (I)*

The sound wall along the western edge of the BART/CalTrain mainline right-of-way may require removal of the tall eucalyptus trees that are considered local scenic resources. The sound wall would also block occasional views of the undeveloped SFIA property west of Highway 101. This loss of scenic resources and alteration to the streetscape along Huntington and San Antonio Avenues would be offset by the proposed landscaping of the sound wall.

3. *Under the Aerial Design Option, the landscaped wall and tailtracks in Millbrae and Burlingame would not result in significant visual effects. (I)*

A landscaped wall extending south from Murchison Drive to approximately 500 feet south of Trousdale Drive in Burlingame would not affect significant views, streetscapes, or sensitive receptors. No significant views exist in this area, the California Drive streetscape is not well-defined, and sensitive receptors would be greater than 60 feet away. The wall in Burlingame would result in a loss of eucalyptus trees identified as a scenic resource along the CalTrain right-of-way. This loss would be offset by the proposed landscaping of the wall.

4. *Above-ground ancillary structures located at the site of the existing San Bruno CalTrain Station would introduce new visual elements into the area; however, these elements of the Alternative VI Aerial Design Option would not significantly change the visual environment. (I)*

Ancillary facilities would be located near Sylvan Avenue east of the existing CalTrain tracks and San Bruno Station. Because of their relatively low, approximately 15-foot profile, the traction power substation, train control bungalow, and ventilation shaft would not obstruct significant views from Huntington Avenue and would be screened from homes on Huntington Avenue by existing trees.

In contrast, a 25-foot antenna would be visible but would not constitute a significant alteration to the built environment or obstruct views. Although the antenna is tall, it would be so narrow that views would still be available around it.

A 20-foot-high rail car wash facility and support building and auxiliary track for up to two trains would be located near Santa Clara Avenue east of the BART and CalTrain tracks. Views of these facilities from the one- and two-story homes on the west side of Huntington and San Antonio Avenues would be screened by the proposed sound wall described above.

5. *Ancillary facilities at the Millbrae Avenue Station under the Alternative VI Aerial Design Option would be visible but would not obstruct significant views or affect streetscapes or sensitive receptors. (I)*

A traction power substation and train control bungalow would be located south of the existing storm drainage channel and between the CalTrain right-of-way and the parking structure. There are no sensitive receptors within 200 feet of these facilities. Limited views of the ancillary facilities may be available from homes along Aviator Avenue in the Bayside Manor neighborhood, but the facilities would be viewed in the context of the BART parking structure, the station, and the Millbrae Avenue overpass. A ventilation shaft would be located above and east of the subway alignment across from Mateo Avenue and may be visible from residences along Hemlock Avenue. The ventilation shaft would be compatible with the visual setting which includes the PG&E Millbrae Substation, would not obstruct significant views or scenic resources, and would be greater than 60 feet from homes.

Aerial Wye-Stub to the SFIA

6. *The aerial guideways across the SFIA property west of Highway 101 would alter the visual setting and detract from this area as a scenic open space resource. (S)*

The aerial wye-stub north and south legs to the Airport International Terminal Station would pass over the SFIA property west of Highway 101, Highway 101 itself, and the I-380 viaduct before entering the SFIA. The Aerial Design Option would introduce an elevated guideway, approximately 50 feet above Highway 101, which would be visible from San Bruno, Millbrae, and by motorists traveling along Highway 101. The BART aerial structure would appear out of context with the undeveloped, natural setting of the west of Bayshore parcel and obstruct views of this area and San Bruno Mountain from Madrone Street in the Marino Vista neighborhood.

MITIGATION MEASURES There are no feasible mitigation measures that would reduce the visual effect of the aerial guideway; therefore, the impact to scenic resources and significant views of this area and San Bruno Mountain would remain significant and unavoidable.

7. *The aerial Airport International Terminal Station (either Option B or X) would be visually compatible with the terminals and double deck roadways at the SFIA. (I)*

Under Option B, the BART airport station would be at the same level as the ALRS, one-level above the departure hall of the SFIA's planned International Terminal. BART facilities, including the loading platform, fare machines, and escalators would be highly visible. Nevertheless, the station

facilities would not significantly alter passengers' views as the BART facilities would be seen juxtaposed with the ALRS and would be consistent with a visual image of a high-technology intermodal transportation center integrating air and rail travel. Moreover, the BART Board of Directors has adopted a set of design standards that call for the architectural, design, and functional integration of the BART Station with the planned International Terminal.

Option X would be located under the ALRS guideway and station and likewise would be integrated visually and structurally with SFIA Master Plan improvements. Since the majority of the BART Station infrastructure would be adjacent to the GTC/RCG, it would be even less directly visible to terminal passengers than Option B. As a result, this station location option would not adversely affect the visual setting for airport passengers nor affect the aesthetics, design, or function of the planned International Terminal.

With respect to other criteria used in this visual analysis, neither Option B nor Option X would obstruct significant views, detract from a scenic resource, or disturb a high-quality streetscape. In terms of station and guideway visibility, these BART facilities would only be visually prominent for motorists arriving from the north along Highway 101 on McDonnell Road. From the south, views would be screened by SFIA improvements such as the planned International Terminal, the GTC/RCG the ALRS, and the elevated highway ramps into and out of the airport. From the north, motorists would see BART's aerial guideway and the station facilities as either Option B or X. The BART project would, however, be viewed in the setting created by the SFIA Master Plan Improvements and would be visually consistent with those projects.

Cumulative Analysis

The cumulative effects of the Alternative VI Aerial Design Option would be the same as those presented for Alternative VI in the DEIR/SDEIS, with the addition of new cumulative impacts caused by the aerial BART guideways and the elevated highway ramps proposed by the SFIA. Specifically, the aerial wye-stub north and south legs to the Airport International Terminal would introduce two elevated guideways alongside new Highway 101 ramps serving SFIA. The guideways and highway ramps would alter the visual setting of the airport entryway for motorists traveling along Highway 101. In addition, BART's facilities on the SFIA property would visually cumulate with the SFIA's proposed ALRS, GTC/RCG, International Terminal, and office/parking structure. The combined effect of these projects would significantly alter the airport entryway from a relatively low profile, low intensity area of roadways and surface parking lots to a high-intensity, mid-rise development area. However, this intensification of use would be viewed in the context of the existing highway structures, including the I-380 viaduct and Highway 101 flyover, and would not be considered a significant cumulative effect since it would not detract from scenic resources nor obstruct significant views. The guideways and ramps would also be visible from higher elevations in Millbrae and San Bruno, but only a small portion of the overall viewshed would be affected. The cumulative effect on distant views would therefore not be significant.

Section 4

Cultural Resources

4.1 EXISTING CONDITIONS

Information regarding existing cultural resources, including those that might be affected by the Aerial Design Option, is provided in Chapter 3, Section 4.1, of the DEIR/SDEIS.

4.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and assess whether the Alternative VI Aerial Design Option would have a significant adverse effect on cultural resources are the same as those presented in Chapter 3, Section 4.2, of the DEIR/SDEIS.

Project-Specific Analysis

The Aerial Design Option (either Option B or X) would result in impacts identical to those described for Alternative VI Tunnel in Chapter 3, Section 4.2, of the DEIR/SDEIS, except for one difference. The Aerial Design Option would alter the setting of one property that is potentially eligible for the National Register of Historic Places. This property would not be affected by Alternative VI Tunnel. Implementation of the Aerial Design Option would not, however, result in significant adverse impacts to this property, as discussed below.

Since the only potential new impact in the study area occurs along the mainline, it is not necessary in this section to distinguish between impacts of the mainline and those of the aerial wye-stub.

1. *The Alternative VI Aerial Design Option would introduce a new visual element into the setting of 540 San Antonio Avenue in San Bruno, a property near the alignment that is potentially eligible for inclusion on the National Register of Historic Places. However, this change would not significantly alter the character of the property's setting. (I)*

A Craftsman-style house at 540 San Antonio Avenue, San Bruno, is potentially eligible for inclusion in the National Register. The building would not need to be removed for the proposed alignment, since it is not situated within the proposed right-of-way. Furthermore, implementation of BART service along the existing tracks would be in keeping with the right-of-way's historic

railroad setting. A sound wall would be included as part of the Alternative VI Aerial Design Option, screening residences fronting along Huntington and San Antonio Avenues from excessive noise associated with BART train operations, but also introducing a new visual element in the setting of 540 San Antonio Avenue. The sound wall would obstruct views of the CalTrain corridor and require the removal of mature eucalyptus trees which contribute to the attractive streetscape.

These changes to the visual setting around the potentially eligible historic property, however, would be diminished by the proposed sound wall landscaping. Plantings of shrubbery and new trees would help screen the mass of the sound wall and would replicate the existing greenery that characterizes the eastward views from the property. Thus, no adverse effects are anticipated from construction of the sound wall under the Alternative VI Aerial Design Option.

Cumulative Analysis

The Aerial Design Option would result in identical cumulative impacts to those presented for Alternative VI in Chapter 3, Section 4.2, of the DEIR/SDEIS.

Section 5

Community Services and Facilities

5.1 EXISTING CONDITIONS

Information regarding existing community services, facilities, and utilities is contained in Chapter 3, Section 5.1, of the DEIR/SDEIS

5.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and assess the significance of impacts to community services, facilities, and utilities of the Alternative VI Aerial Design Option are described in Chapter 3, Section 5.2, of the DEIR/SDEIS.

Project-Specific Analysis

The impacts of the Alternative VI Aerial Design Option (either Option B or X) would be the same as those described for Alternative VI in Chapter 3, Section 5.2, of the DEIR/SDEIS, with the exception of the one impact described below. In addition, the location of the train car wash facility would be shifted south onto the SFIA west of Bayshore parcel under the Aerial Design Option. This would not, however, change impacts to water services relative to Alternative VI Tunnel. Under Alternative VI Tunnel, the car wash would be located in San Bruno south of Browning Way and north of the Tanforan Station. In either case, the City of San Bruno would provide water services to the facility.

1. *Under the Aerial Design Option, it may be necessary to evacuate passengers during an emergency. Evacuation could be into unfamiliar surroundings or directly onto the aerial walkway. This potentially significant impact would be avoided by implementation of in-place procedures. (1)*

Emergency evacuation of passengers would be virtually the same for the Aerial Design Option as for Alternative VI Tunnel, even though evacuation would be from aerial facilities under the former and from underground under the latter. The BART Emergency Plan (1994) and Train Operators Manual (1983) identify procedures for safe evacuation from all potential evacuation sites, including aerial structures and underground between stations. The Plan stipulates that local fire department services shall be requested to respond during passenger emergency evacuation of BART trains.

Cumulative Analysis

The potential cumulative impacts to community services resulting from the Alternative VI Aerial Design Option, in conjunction with future population growth and the anticipated demands of the SFIA expansion, would be the same as those presented for Alternative VI in Chapter 3, Section 5.2, of the DEIR/SDEIS.

Section 6

Geology, Soils, and Seismicity

6.1 EXISTING CONDITIONS

Information regarding existing geologic, soils, and seismic conditions is presented in Chapter 3, Section 6.1, of the DEIR/SDEIS.

6.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and evaluate the significance of geologic, soils, and seismic impacts of the Alternative VI Aerial Design Option are the same as those described in Chapter 3, Section 6.2, of the DEIR/SDEIS.

Project-Specific Analysis

The impacts of the Aerial Design Option along the mainline would be the same as those presented for Alternative VI in Chapter 3, Section 6.2, of the DEIR/SDEIS, except that impacts related to tunnel segments of the alignment would not occur, and the associated tunnel design mitigation measure would not need to be implemented. Although the Aerial Design Option features aerial guideways that would be subject to seismicity, settlement, and liquefaction, these effects would be mitigated to an insignificant level, as described below.

Mainline through San Bruno, Millbrae, and Burlingame

1. *Under the Aerial Design Option, the below-grade segments (retained cut and subway) along the mainline would be subject to lateral pressures and hydrostatic uplift during seismic events. Adherence to BART design criteria, which includes provisions for the design of below-ground walls, would reduce this impact to an insignificant level. (1)*

Seismic design procedures for earth-retaining structures are outlined in Section 16.8.2 of BART's seismic design criteria. In accordance with these criteria, the total lateral soil pressure for walls subject to seismic loading is determined by adding a seismic pressure component to the static pressure component. The design criteria outline procedures for calculating seismic loading on yielding walls and rigid walls, and then require that facilities be designed accordingly. The design

criteria also specify requirements and design procedures for BART facilities to account for hydrostatic uplift forces. Section 9.3.6 of the design criteria requires that underground structures be designed with a minimum factor of safety against flotation. This minimum is 1.03 at any construction stage and 1.07 when the structure is complete. Additionally, the design criteria stipulate the use of deep foundation elements, thereby reducing this impact to an insignificant level.

Aerial Wye-Stub to the SFIA

2. *The aerial wye-stub and Airport International Terminal Station proposed under the Alternative VI Aerial Design Option would be subject to strong groundshaking due to locally active faults. The impact of seismic activity and soft soils are more severe for above ground aerial structures compared with the underground tunnel in Alternative VI. (S)*

MITIGATION MEASURE. Implementation of the same mitigation measure (Mitigation Measure 3, development of seismic design data for SFIA, in Chapter 3, Section 6.2, of the DEIR/SDEIS, would reduce the impact of groundshaking at all proposed facilities in the study area to an insignificant level.

3. *Settlement of driven piles under the proposed aerial guideway section between the CalTrain/BART mainline, Highway 101, and the Airport International Terminal Station would occur because of the soft, compressible, clayey soils underlying the area. Adherence to the BART design criteria would reduce this impact to an insignificant level. (I)*

Consolidation of compressible soils under the applied loading of the aerial guideways and Airport International Terminal Station could result in settlement of piles and differential settlement between adjacent piles, if the piles were not driven through this soft clay layer. If the pile-supported structure were not properly designed to tolerate these settlements, significant strains would occur on the aerial structure which could lead to cracking.

Section 8.3 of the design criteria states that differential settlement must be considered, especially where underlying soils create concerns. These design criteria also specify a maximum allowable settlement between adjacent piers supporting an aerial. Adherence to these criteria would reduce the potential for settlement to an insignificant level.

4. *The aerial wye-stub across the SFIA property west of Highway 101 and the Airport International Terminal Station may be susceptible to localized liquefaction. Adherence to the BART design criteria would reduce this impact to an insignificant level. (I).*

Section 16.6 of the design criteria states that a geotechnical report shall be prepared as part of the seismic design for a structure that will be underlain by potentially liquefiable soils. Section 6.3 of the design criteria indicates that pile foundations should be used where there is a potential for seismically induced settlement, and that the design of piles should take into consideration the effect of negative skin friction which may result from the settlement of fill materials. By supporting the structure on piles that extend through the potentially liquefiable artificial fills and underlying soft Bay Mud, the impact of seismically induced settlement would be reduced to an insignificant level.

Cumulative Analysis

The cumulative impacts of the Aerial Design Option would be the same as those described for Alternative VI in Chapter 3, Section 6.2, of the DEIR/SDEIS.

Section 7

Biological Resources

7.1 EXISTING CONDITIONS

Existing conditions information regarding the biotic resources is presented in Chapter 3, Section 7.1, of the DEIR/SDEIS.

7.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The significance criteria and methodology used to evaluate impacts to biotic resources associated with the Alternative VI Aerial Design Option are the same as those presented in Chapter 3, Section 7.2, of the DEIR/SDEIS.

Project-Specific Analysis

Under the Alternative VI Aerial Design Option, biotic resource impacts would differ from those identified for Alternative VI in the DEIR/SDEIS. The alignment on the west of Bayshore parcel would be constructed in aerial rather than subway configuration, and the alignment would be moved to areas where it would cause impacts to significant resources in the study area. As with Alternative VI, the Aerial Design Option east of Highway 101 within the SFIA would not result in any impacts to biological resources. A detailed plan to mitigate possible project impacts to biotic resources would be developed in consultation with the U.S. Fish and Wildlife Service, California Department of Fish and Game, and the U.S. Army Corps of Engineers.

Mainline through San Bruno, Millbrae, and Burlingame

1. *The Alternative VI Aerial Design Option would require the redirection, modification, and/or displacement of wetland or creek areas. The wetland area impacted by these measures totals approximately 0.97 acres. (S)*

The following discussion identifies specific points along the mainline track alignment where wetlands and/or creek habitats would be displaced through San Bruno, Millbrae, and Burlingame.

Cupid Row Canal. The Aerial Design Option would require redirecting a reach of the Cupid Row Canal above the proposed BART alignment and lining the reach with concrete. This portion of Cupid Row Canal is south of Lion's Field and is approximately 140 feet in length. The reach would be temporarily diverted and replaced with a concrete-lined channel to protect the BART subway box structure beneath the canal (see Figure 3.7-6, Photo 5 in the DEIR/SDEIS). The concrete lining of this portion of Cupid Row Canal would result in the placement of fill material in approximately 0.04 acres of wetland habitat associated with this portion of the canal. This action would likely necessitate Sections 404 and 10 permits from the U.S. Army Corps of Engineers (ACOE), a Streambed Alteration Agreement from the California Department of Fish and Game (CDFG), and may require a Section 9 permit from the U.S. Fish and Wildlife Service (USFWS). Recent field surveys have determined that this reach of Cupid Row Canal supports the California red-legged frog; at one time the San Francisco Garter Snake (SFGS) was found in this canal. The San Francisco forktail damselfly is also known to occur in this canal.

Drainage Ditches west of CalTrain Tracks. The Aerial Design Option would require the placement of fill material in three drainage ditches west of the CalTrain tracks in order to construct the proposed sound wall and a CalTrain service road. This action would result in the loss of approximately 0.13 acres of wetland habitat. The ditches range in width from 3 to 6 feet and carry stormwater flows under the tracks, from San Antonio Avenue toward the west of Bayshore parcel. Filling the ditches would require a Section 404 permit from the ACOE, and possibly a Section 9 permit from the USFWS.

San Felipe-South Lomita Canal. The Aerial Design Option would require modifications or alterations to three wetland and/or creekbed habitat sites along the San Felipe-South Lomita Canal:

- In a short section of the earthen ditch portion of the San Felipe-South Lomita Canal and within a depression supporting a seasonal wetland, east of Santa Dominga Avenue – Placement of fill in these sites would result in the removal of approximately 0.65 acres of creekbed and seasonal wetland habitats.
- In a portion of a second seasonal wetland area along the San Felipe-South Lomita Canal and a small tributary channel flowing east into San Felipe Canal – Placement of fill in these sites would result in the removal of approximately 0.12 acres of wetland habitats.
- Two short sections of a tributary drainage channel to South Lomita Canal near the proposed south tunnel portal – Relocation of these sections would bury approximately 0.03 acres of permanent wetland habitat.

All of these actions would require a Section 404 permit from the ACOE, a Section 9 take permit from the USFWS under the Federal Endangered Species Act (ESA), and a take permit or management agreement from the CDFG under Section 2081 of California Fish and Game Code. Some of these actions may also require a Streambed Alteration Agreement from the CDFG.

MITIGATION MEASURES. It is not possible to avoid impacting the sensitive habitats in the west of Bayshore parcel during operation of the mainline tracks of the Alternative VI Aerial Design Option. The following measures are proposed, however, to minimize these impacts. Mitigation Measures 1.1 and 1.2 would require the cooperation and approval of the SFIA, the property owner. In discussions to date, agreements have not been made which would enable BART to mitigate for BART-related impacts on SFIA property. BART could seek to acquire all or a portion of the west

of Bayshore parcel from the SFIA for implementation of these mitigation measures. However, should BART be unsuccessful in acquiring the required land, BART would then implement Mitigation Measure 1.3 or other measures in consultation with the resource agencies that would achieve the same level of mitigation.

- 1.1 *Creation of Creekside and/or Seasonal Wetland Habitats of Equal Wildlife Habitat Values.* The habitat values of these wetlands are high, due to the fact that they support the endangered SFGS, California red-legged frog, and San Francisco forktail damselfly. To adequately compensate for the loss of wetland habitat values for these high-quality wetlands, the resource agencies may require a mitigation ratio between 1:1 and 3:1. Using the 3:1 ratio as a conservative estimate, the mitigation requirement for impacted wetland would be approximately 3.0 acres of created wetland. The actual compensation ratio or other measures that would achieve the same level of mitigation will be determined in consultation with the resource agencies.

Habitat creation or enhancement measures should preferably take place before project construction, thereby avoiding the loss of wetland habitat values during project construction. If this could be achieved, then the required mitigation ratio might be reduced.

The most suitable mitigation site would be within the west of Bayshore parcel. Creation of wetlands on this parcel would represent an onsite mitigation and, if planned properly, would benefit the SFGS, California red-legged frog, and San Francisco forktail damselfly. One possible mitigation site would be at the northern end of the San Felipe Canal between Santa Dominga and San Felipe Avenues (see Figure 3.7-5 in the DEIR/SDEIS). Prior to 1970 when the canal was relocated, it extended to this location. At the end of San Felipe Avenue, a pair of stormwater culverts pass under the railroad tracks and into an underground system of box culverts on the west of Bayshore parcel. Additional wetlands could be created by extending the existing canal approximately 900 feet to the north and directing the stormwater flows into the canal and away from the underground box culverts. The existing San Felipe Canal, extending from Santa Dominga Avenue to the pump station near Santa Helena Avenue, would be widened from an average width of 16 feet to an average width of 40 feet (see Figure 3.7-5 in the DEIR/SDEIS). These actions would create approximately 1.93 additional acres of perennial wetlands on the site.

This additional wetland habitat area would not be large enough to fully compensate for impacts to the five sites. Consequently, additional wetland creation may be required on the west of Bayshore parcel. There is currently estimated to be approximately 60 acres of upland area that may be potentially converted to wetland mitigation sites. Possible locations for additional wetland creation are identified in Figure 3.7-5 in the DEIR/SDEIS. For example, there are available means to create an additional seasonal wetlands within the upland areas west of Cupid Row Canal in the northernmost portion of the west of Bayshore parcel. The habitat benefits of the created seasonal wetlands in this area would be augmented by better management of the tide gate at the mouth of Cupid Row Canal to enhance freshwater habitats, as described in Mitigation Measure 1.2, below. If planned properly, wetlands created in any of these areas would benefit the endangered SFGS and the two other sensitive species that inhabit these wetlands.

A detailed wetland mitigation plan would be developed for these and any other wetland mitigation sites. This plan would require approval by the appropriate resource agencies. This plan would present all mitigation measures in detail and evaluate the probable effectiveness of these measures. Examples of the details that would be required include:

- *A report that provides baseline information on the quality of both the impacted habitats as well as the proposed mitigation sites.* Descriptions of plant species diversity, shrub and tree canopy cover, tree height, detailed topographic mapping, and characterization of the soils and hydrologic regime of each site would be included in this report.
- *Assessment criteria based upon the report.* Created wetlands would be deemed a success if the plant cover, density, and diversity equaled or exceeded these parameters at a selected “model” site, and if the rate of growth, health, and reproduction of the vegetation approximated natural conditions.
- *A monitoring program consisting of annual evaluations for at least the first five years thereafter or until all success criteria have been met.*
- *An identification of which agency(s), persons, or private interests would ultimately own, maintain, and manage the mitigation site.* One possibility is that SamTrans and BART would share in these responsibilities.
- *A mechanism to fund the maintenance and management of the mitigation site.*
- *The requirement that “as-built” plans be prepared.* The report would describe the construction of the mitigation site, problems encountered, and corrective measures taken.

1.2 *Management of Cupid Row Canal Tide Gate.* Cupid Row Canal has been known in the past to support the SFGS and the red-legged frog (Wharton, 1989). Except for a small area at the far western end of the canal where the red-legged frog has been sighted (Marangio, 1993), these two sensitive species have been eliminated from the canal due to the intrusion of saltwater through a broken tide gate. Repair and proper maintenance of this gate would enhance the habitat value at this particular site for the red-legged frog, other amphibians, and the SFGS. Proper management, including periodic hand clearing of the tule growth within the canals, would improve habitat quality for the SFGS, red-legged frog, and forklift damselfly.

1.3 *Creation and Enhancement of Wetland Habitats Onsite but Outside of the West of Bayshore Parcel.* If BART is unable to implement Mitigation Measures 1.1 and/or 1.2, BART will convert the large seasonal wetland on the west side of the CalTrain tracks near Madrone Street into a permanent wetland similar to that along South Lomita Canal on the east side of the tracks. This piece of property will be in BART ownership. BART will enlarge and extend the depression north approximately 450 feet, and enlarge the seasonal wetland to the approximate size of South Lomita Canal. The flow from the tributary channel immediately to the south will then be diverted north into the enlarged channel and directed under the CalTrain and BART tracks back to the existing South Lomita Canal. The upper channel banks will be planted with blackberry bushes to replace the cover habitat lost on the east side of the tracks. This mitigation measure would create approximately 1.48 acres of wetland habitat out of the upland habitats that now occur at this site, and convert the 0.34 acre seasonal wetland at this site into a permanent wetland similar to South Lomita Canal.

Other potential upland sites that may be converted into wetlands in the immediate vicinity of the west of Bayshore parcel would include the community garden site immediately north of Cupid Row Canal (approximately 1.4 acres), and the uplands immediately east of the PG&E substation between Bayside Manor and North Millbrae neighborhoods (approximately 2.24 acres). Use of these properties as mitigation sites would result in impacts to the current land uses of these properties. If BART is able to purchase these properties or negotiate an agreement with the City of San Bruno and PG&E for the development of wetlands on these parcels, BART would have approximately 5.12 acres, enough land to mitigate for the loss of wetland habitats as a result to the project. BART will work closely with the CDFG, USFWS and other resources agencies to determine if additional sites west of the tracks would be suitable for similar types of habitat enhancement efforts or other measures that would achieve the same level of mitigation.

2. *The mainline tracks of the Aerial Design Option would result in the displacement and/or loss of habitat that support the SFGS, the California red-legged frog, and the San Francisco forktail damselfly. (S)*

The Aerial Design Option at-grade mainline would eliminate approximately 9.87 acres of wetland and upland habitats used by the endangered SFGS. Of this 9.87 acres, approximately 0.85 acres are known to support the California red-legged frog and San Francisco forktail damselfly.

MITIGATION MEASURES. Suitable mitigation measures for this impact will have to be approved by the USFWS under Sections 7 and 9 of the federal ESA and the CDFG under the state ESA. BART will initiate formal consultation with the USFWS under Section 7 of the federal ESA to develop the appropriate mitigation measures. Implementation of either of the first two following mitigation measures would reduce the impact to an insignificant level. However, as noted above, implementation of any mitigation measure on the west of Bayshore parcel may be difficult because it depends upon the landowner. Should BART be unsuccessful in obtaining the necessary agreements from the SFIA, BART would then seek to implement Mitigation Measure 2.3 below.

- 2.1 *Management and Enhancement of Existing Aquatic Habitats.* Various management practices will be implemented by BART to improve the habitat quality of existing wetlands in this area. For example, repair and proper maintenance of the tidal gate to Cupid Row Canal will enhance the habitat value for the red-legged frog, other amphibians, and the SFGS (Mitigation Measure 1.1, above).
- 2.2 *Habitat Restoration Plan.* A detailed *Habitat Restoration Plan (HRP)* for the San Francisco Garter Snake (Draft) was prepared for the BART extension project in 1992 after the AA/DEIR/DEIS was released (EIP, 1992)¹ The goal of the HRP is to establish a permanent preserve in the southern 18 acres of the west of Bayshore parcel (see Figure 3.7-7 in the DEIR/SDEIS), which would sustain a viable breeding population of the SFGS in perpetuity. The HRP proposes to construct five shallow ponds on the 18-acre site, each with a static water level maintained by a potable water source. The preserve would be fenced and signed to prevent illegal trespassing and an exotic species and predator control program would be

¹ For further reference, the Draft HRP is available for review at the BART offices at 1000 Broadway, Oakland, California.

implemented. Ownership of the 18-acre preserve would be transferred to the state and it would be managed, maintained, and monitored by an Endangered Species Management Authority, composed of representatives of the SFIA, PG&E, San Mateo County, CDFG, and the USFWS. The preserve would be stocked with SFGS trapped on other parts of the SFIA property west of Highway 101 outside of the proposed preserve. The HRP projects start-up costs to be approximately \$25,000, development and construction costs to be between \$300,000 and \$400,000 and long-term management costs to be approximately \$13,500 annually.

- 2.3 *Purchase of Offsite Location and Establishment of Management Endowment.* BART will purchase a parcel of land approved by the USFWS and CDFG and donate the property to an appropriate land management organization for the preservation and management of the SFGS population. In addition, BART will establish an endowment to provide the management agency with resources to properly maintain the viability of the SFGS population. Details of this mitigation measure, including the size and location of the site as well as the appropriate endowment will be developed in further consultation with the USFWS and the CDFG.

Aerial Wye-Stub to the SFIA (Options B and X)

The following discussion identifies specific points where the Alternative VI Aerial Design Option would disturb wetlands and/or creek habitats along the aerial wye-stub to the SFIA. These impacts and associated mitigation measures would apply to Option B or X.

3. *The aerial track alignment portion of Aerial Design Option would require the placement of column structures within the wetlands on the west of Bayshore parcel. This action would permanently displace approximately 0.04 acres of wetland habitats. (S)*

The column structures for the aerial tracks into and out of the SFIA would typically be spaced along the aerial alignment on 80-foot centers. This design calls for the placement of two columns in one of the seasonal wetlands located immediately west of Highway 101 (hereafter referred to as Wetland F). The Aerial Design Option does not propose the placement of columns in South Lomita Canal and other seasonal wetlands on the west of Bayshore site. The footprint of each column foundation in the seasonal wetlands is expected to be approximately 30 by 30 feet, or 0.02 acres each, for a total of 0.04 acres of wetland habitats displaced. Wetland F is known to support the endangered SFGS and the San Francisco forktail damselfly. The placement of aerial columns in this wetland would require a Section 404 permit from the ACOE under the Clean Water Act, a Section 9 permit from the USFWS under the federal ESA, and a take permit or management agreement from the CDFG under Section 2081 of the California Fish and Game Code.

MITIGATION MEASURES. BART has designed the track alignment to avoid the seasonal wetlands immediately west of Highway 101 to the greatest extent possible, given the speeds the trains can safely maintain on curves, and the room available to minimize disruption of the PG&E transmission lines. Alternative alignments would result in greater disturbance to wetland habitats.

Implementation of the following mitigation measure would reduce the impact to an insignificant level. As noted above, implementation of any mitigation measure on the west of Bayshore parcel depends on SFIA cooperation. Should BART be unsuccessful in acquiring the needed land for

mitigation as recommended below, BART would then seek to implement Mitigation Measure 1.3 above, or other measures, developed in consideration with the resource agencies, that would achieve the same level of mitigation.

3.1 *Creation of Wetlands of Equal Wildlife Habitat Quality.* The habitat values in Wetland F are high because this wetland is known to support the SFGS and San Francisco forktail damselfly. To adequately compensate for the loss of high quality wetlands, the resource agencies may require between 1:1 and 3:1 replacement ratio. Using the 3:1 ratio as a conservative case, this impact would require approximately 0.12 acres of wetlands to be created. The actual compensation ratio will be determined in consultation with the resource agencies during the resource agency consultation process. Possible locations on the west of Bayshore parcel for additional wetland creation are identified in Figure 3.7-5 in the DEIR/SDEIS. If planned properly, wetlands created in any of these areas would benefit the endangered SFGS and the two other sensitive species that inhabit these wetlands.

4. *The aerial wye-stub into the SFIA of the Aerial Design Option would result in the displacement and/or loss of habitats that support the SFGS, the California red-legged frog, and the San Francisco forktail damselfly. (S)*

The aerial track column footings would displace 0.59 acres of upland and wetland habitats on the west of Bayshore parcel that support the endangered SFGS. Of this 0.59 acres, approximately 0.04 acres would be wetlands also known to support the California red-legged frog and the San Francisco forktail damselfly.

MITIGATION MEASURES. Implementation of the same mitigation measures identified for Impact 2 above would reduce the impact an insignificant level.

Cumulative Analysis

The cumulative impacts to biological resources associated with the Alternative VI Aerial Design Option would be identical to those described for Alternative VI in Chapter 3, Section 7.2, of the DEIR/SDEIS.

Section 8

Hydrology and Water Quality

8.1 EXISTING CONDITIONS

Information regarding existing hydrology and water quality conditions in the study area can be found in Chapter 3, Section 8.1, of the DEIR/SDEIS.

8.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and evaluate the significance of hydrology and water quality impacts associated with the Alternative VI Aerial Design Option are presented in Chapter 3, Section 8.2, of the DEIR/SDEIS.

Project-Specific Analysis

The impacts of the Alternative VI Aerial Design Option would be similar to those described for Alternative VI in Chapter 3, Section 8.2, of the DEIR/SDEIS. An exception is that flooding impacts in tunnel structures would not occur under the Aerial Design Option, although other BART facilities within the floodplain would be subjected to flooding during periods of severe storms. Two potential new impacts of the Aerial Design Option are presented below.

Mainline through San Bruno, Millbrae, and Burlingame

1. *Placement of the mainline tracks under the Aerial Design Option through the 100-year floodplain would displace some floodplain storage capacity and increase the potential of flooding in the vicinity. (I)*

Fill to accommodate the mainline tracks as they approach the wye connection and by South Lomita Canal just north of Madrone Street would displace some floodplain storage capacity and obstruct overland drainage patterns. This obstruction would not aggravate localized flood conditions in these areas because BART plans to relocate drainage channels and extend culverts to maintain existing drainage volumes and flows, thereby reducing the impact to an insignificant level.

Aerial Wye-Stub to SFIA

2. *Under the Aerial Design Option, placement of supporting columns for the aerial guideways in the SFIA west of Bayshore parcel would affect overland flow and displace floodwater storage volume. (I)*

The Aerial Design Option would require the placement of columns to support the aerial wye-stub, in the SFIA west of Bayshore parcel. This parcel contains lands within the 100-year and 500-year floodplain. The columns would disrupt overland flow of stormwaters and decrease the capacity of this area to store stormwaters. However, these effects would be insignificant because the column footings are on average about 30 feet by 30 feet, and the total land area filled would be about 0.5 acres. Furthermore, the columns supporting the aerial facility lie not in the 100-year, but in the 500-year, floodplain.

Cumulative Analysis

The cumulative impacts of the Aerial Design Option would be the same as those described for Alternative VI in Chapter 3, Section 8.2, of the DEIR/SDEIS.

Section 9

Noise and Vibration

9.1 EXISTING CONDITIONS

Information regarding existing noise and vibration levels is presented in Chapter 3, Section 9.1, of the DEIR/SDEIS.

9.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and evaluate the significance of noise and vibration impacts of the Aerial Design Option are the same as those presented in Chapter 3, Section 9.2, of the DEIR/SDEIS. As discussed in the DEIR/SDEIS, the selection of significance criteria for each noise-sensitive receptor is based upon consideration of the existing ambient noise environment, type of receptor, and the Community Area Category in which the receptor lies. Consequently, if an area is already exposed to high traffic volumes or CalTrain service, this is taken into account in selecting an appropriate significance criteria for defining noise and vibration impacts.

Project-Specific Analysis

The impacts of the Aerial Design Option would be the same as those described for Alternative VI in Chapter 3, Section 9.2, of the DEIR/SDEIS, with the following exceptions:

- Vibration impacts would not occur at four to five residences along Huntington Avenue in the Lomita Park neighborhood of San Bruno and seven to eight homes on Santa Paula Avenue in the North Millbrae neighborhood of Millbrae, since the BART tracks, including the crossover, would no longer be close enough to affect these receptors.
- Vibration impacts would not occur at the proposed International Terminal and possibly at an office building at SFIA because the alignment would be in aerial, not subway, configuration.
- Noise and vibration impacts would not occur at 11 to 12 homes along Aviator Avenue due to increased distance of the alignment to these sensitive receptors and because the crossovers have been reconfigured. Because of these changes, there would also be fewer impacts with less severity for homes in the same vicinity. This difference is described in the impact analysis below.

In addition, homes along San Antonio Avenue in San Bruno and in the Marino Vista, Airport Park, and Millbrae Manor neighborhoods of Millbrae and the SFIA would experience new noise and/or vibration impacts because of the aerial guideway, changes in the proximity of the alignment and crossovers, and changes in the location of the auxiliary tracks. These new impacts are described below.

Mainline through San Bruno, Millbrae, and Burlingame

1. *Airborne noise from the at-grade segment of the Alternative VI Aerial Design Option would significantly affect San Bruno residents. (S)*

Potential airborne noise impacts to single family residences near the BART mainline service are based on exposure to train passbys exceeding a significance criterion of 75 dBA. The BART alignment through the San Bruno portion of the study area would run at grade and in retained cut. Under the Aerial Design Option, a sound wall would be constructed along the western edge of the CalTrain right-of-way, thereby screening residents along Huntington and San Antonio Avenues from both CalTrain and BART trains.

A sound wall that would obstruct noise from BART trains at the ground level or on the sidewalks would not be sufficient to minimize impacts at the second floor level of five to fourteen homes along San Antonio Avenue. They would still experience noise levels 4 to 7 dBA in excess of the criterion. Residences along this segment would not be affected by airborne noise under Alternative VI Tunnel, since the alignment does not run along the CalTrain right-of-way but veers eastward in tunnel to the SFIA.

MITIGATION MEASURES. Implementation of the following mitigation measure would reduce this impact to an insignificant level.

- 1.1 *Sound Barrier Wall.* BART will construct an at-grade sound barrier wall 15 feet above grade along the CalTrain right-of-way.
2. *Under the Aerial Design Option, operation of BART vehicles on the auxiliary track in San Bruno would generate airborne noise and groundborne noise levels less than those generated on the main tracks. No significant impact to sensitive receptors is anticipated. (I)*

Potential airborne noise impacts to single family residences near the auxiliary track are based on exposure to train noise exceeding a significance criterion of 75 dBA. The BART car wash track is proposed parallel to and east of the mainline alignment between San Marco and Santa Maria Avenues in the Lomita Park neighborhood of San Bruno. This track is located approximately 245 feet from the nearest residence. The slow operating speeds and distance from the Lomita Park neighborhood, plus the proposed sound wall included as part of the Aerial Design Option, would result in noise levels below the 75 dBA criterion. The combined effects of BART noise from the auxiliary track and the mainline operations would be essentially the same as that identified for the mainline operations identified above under Impact 1 and would therefore not result in impacts beyond those noted in Impact 1.

3. *Under the Alternative VI Aerial Design Option, the proposed car wash facility would generate airborne noise levels but would not significantly affect residents in the Lomita Park neighborhood of San Bruno. (I)*

Potential airborne noise impacts to single family residences near the car wash facility are based on exposure to noise exceeding a significance criterion of 60 dBA for ancillary facilities. Under the Aerial Design Option, the BART car wash facility is proposed parallel to and east of the mainline between Santa Inez and Santa Clara Avenues along the storage tracks. The proposed sound wall along the western edge of the CalTrain right-of-way would provide partial noise screening for residences along Huntington Avenue in the Lomita Park neighborhood of San Bruno, and the car wash would generate noise levels at the upper floors less than the 60 dBA criterion. Residences along this segment would not be affected by airborne noise under Alternative VI Tunnel, since the car wash would be located further north near the Tanforan Station.

4. *Lomita Park Elementary School in Millbrae, which is close to the at-grade portion of the Aerial Design Option, may be affected by train noise from BART service. (PS)*

Potential airborne noise impacts to schools near the mainline are based on exposure to train passby noise exceeding a significance criterion of 75 dBA. The BART mainline alignment through this Millbrae portion of the study area would run at grade. Under the Aerial Design Option, a sound wall would be constructed along the western edge of the CalTrain right-of-way, thereby offering some screening from both CalTrain and BART trains. Noise levels would be significant if the proposed sound wall were not sufficiently high to attenuate the noise.

MITIGATION MEASURE. Mitigation Measure 1.1, i.e., sound barrier wall identified above would be applicable to this impact.

5. *Homes in the Airport Park neighborhood in Millbrae would experience significant airborne noise impacts under the Alternative VI Aerial Design Option. (S)*

Potential airborne noise impacts to single family residences near the BART mainline service are based on exposure to train passbys exceeding a significance criterion of 75 dBA. The BART alignment passes the Airport Park neighborhood portion of the study area in retained cut. Under the Aerial Design Option, a sound wall would be constructed above grade along the western edge of the CalTrain right-of-way, thereby offering some noise attenuation for residents along Landing Lane from both CalTrain and BART trains.

Residences in the Airport Park neighborhood would not be affected by airborne noise under Alternative VI Tunnel, since the alignment does not run along the CalTrain right-of-way but veers eastward in tunnel to the SFIA.

MITIGATION MEASURES. Implementation of the following mitigation measure would reduce airborne noise impacts for homes on Landing Lane to an insignificant level.

- 5.1 *Sound Barrier Wall.* BART will use an at-grade sound barrier wall, at a height of 15 to 16 feet above grade, located along the western edge of the CalTrain right-of-way. However,

for a relatively short stretch adjacent to 10 to 12 homes along Landing Lane, the sound wall will be 20 feet high. The specific topography between the CalTrain railroad tracks and the homes requires that this higher sound wall be placed further west compared to the segment of the sound wall just to the north.

6. *Homes in the Airport Park neighborhood in Millbrae would experience significant groundborne vibration impacts under the Alternative VI Aerial Design Option. (S)*

Potential groundborne vibration impacts to single family residences near the BART mainline service are based on exposure to train passbys exceeding a significance criterion of 70 dB. Because of the proximity of the alignment, groundborne vibration levels would be up to 1 dB in excess of the criterion at nine to eleven homes in the Airport Park neighborhood.

Residences in the Airport Park neighborhood would not be affected by groundborne vibration under Alternative VI Tunnel, since the alignment does not run along the CalTrain right-of-way but veers eastward in tunnel to the SFIA.

MITIGATION MEASURES. Implementation of either of the following mitigation measures individually would reduce the identified groundborne vibration impact to an insignificant level.

- 6.1 *Resiliently Supported Ties or Soft Rail Fasteners.* BART will comply with its design criteria by using resiliently supported ties, soft rail fasteners, or other equally effective techniques. The selection of the appropriate technique would be made during the preliminary design phase.
- 6.2 *Offsite Mitigation.* As an alternative to resilient ties or soft rail fasteners, BART will use an offsite mitigation providing equivalent mitigation, such as the isolation of a building at its points of contact to the ground. Isolating a building would entail raising the building and placing a neoprene pad at the points where the building rests on its foundation.
7. *Homes in Millbrae near crossovers would experience groundborne noise and vibration impacts from the Alternative VI Aerial Design Option. (S)*

Potential groundborne vibration impacts to single family residences near the BART mainline service are based on exposure to train passbys exceeding a significance criterion of 75 dBA; for groundborne noise, the applicable standard is 35 dBA. Under the Aerial Design Option, BART would pass the Marino Vista, North Millbrae, Millbrae Manor, and Bayside Manor neighborhoods of Millbrae in cut-and-cover subway.

Because of the proximity to proposed crossovers, a total of 14 to 17 homes would experience groundborne vibration levels in excess of the 75 dBA criterion. Two homes at the intersection of Monterey and Madrone in the Marino Vista neighborhood and one home on Hemlock Avenue in the Millbrae Manor neighborhood would experience groundborne vibration levels up to 2 dB in excess of the criterion. Eleven to 14 homes on Aviator Avenue in the Bayside Manor neighborhood would experience groundborne vibration levels up to 5 dBA in excess of the

criterion. The homes on Aviador Avenue would also experience groundborne noise levels up to 2 dBA in excess of the 35 dBA criterion.

The residences in the Marino Vista neighborhood would not be affected by groundborne vibration under Alternative VI Tunnel, since the alignment does not run along the CalTrain alignment but veers to the east in tunnel to the SFIA. The affected residences in the Millbrae Manor and Bayside Manor are different than those for which significant groundborne vibration and noise impacts are noted under Alternative VI Tunnel. However, the magnitude of the impacts (the excess over the identified significance criteria) is less under the Aerial Design Option.

MITIGATION MEASURES. Mitigation Measure 6.1, i.e., resiliently supported ties or soft rail fasteners, or Mitigation Measure 6.2, i.e., offsite mitigation, would reduce significant groundborne vibration and noise impacts at the homes in the Marino Vista and Millbrae Manor neighborhoods to an insignificant level. Mitigation Measure 7.1 below, or Mitigation Measure 6.2, i.e., offsite mitigation, would reduce these same impacts at homes in the Bayside Manor neighborhood to an insignificant level.

7.1 Floating Slab Trackbed. BART will comply with its design criteria by using a floating slab trackbed or other equally effective techniques. The selection of the appropriate technique would be made during the preliminary design phase.

8. *Under the Aerial Design Option, operation of BART vehicles on the tailtracks in Burlingame would generate airborne noise levels below the applicable significance criterion. (I)*

Potential airborne noise impacts to new multifamily residences and a senior care facility near the tailtracks in Burlingame are based on exposure to train noise exceeding a significance criterion of 75 dBA. The at-grade BART tailtracks are proposed parallel to and east of the CalTrain alignment. Nearby sensitive receptors include a recently approved condominium project and a senior health care facility, both south of the Burlingame Police Department along California Drive. The slow operating speeds and distance from these land uses, plus the proposed sound wall included as part of the Aerial Design Option, would result in noise levels below the 75 dBA criterion.

This same conclusion of insignificant airborne noise impacts would also apply to Alternative VI Tunnel, even though a sound wall was not proposed as part of that alternative.

Aerial Wye-Stub to the SFIA (Options B and X)

9. *The aerial guideways of the Alternative VI Aerial Design Option would create airborne noise impacts for homes in San Bruno. (S)*

Potential airborne noise impacts to single family residences near BART service are based on exposure to train passbys exceeding a significance criterion of 75 dBA. About 16 to 20 homes along San Antonio Avenue in the Lomita Park neighborhood in San Bruno would experience passby noise from the aerial wye-stub. Noise levels would be up to 2 dBA in excess of the residential criterion for airborne noise. These residences in the Lomita Park neighborhood would

not be affected under Alternative VI Tunnel because the alignment into the SFIA veers east away from these homes in tunneled subway.

MITIGATION MEASURES. Implementation of the following mitigation measure would reduce this impact to an insignificant level.

9.1 *Aerial Structure Sound Barrier Wall.* BART will satisfy its design criteria for passby noise by constructing an aerial structure sound barrier wall or implementing other measures achieving the necessary noise mitigation.

10. *The Lomita Park Elementary School in Millbrae would be exposed to significant airborne noise impacts from the Alternative VI Aerial Design Option. (S)*

Potential airborne noise impacts to schools near the mainline are based on exposure to train passby noise exceeding a significance criterion of 75 dBA. The aerial wye-stub (southern leg) of the Aerial Design Option would generate noise levels up to 2 dBA in excess of the criterion at the school's playground. Lomita Park Elementary School would not be affected by airborne noise under Alternative VI Tunnel, since the alignment does not run along the CalTrain right-of-way but veers eastward in tunnel to the SFIA.

MITIGATION MEASURES. Implementation of Mitigation Measure 9.1, i.e., aerial structure sound barrier wall, would reduce this impact to an insignificant level.

11. *An office building at the SFIA would experience airborne noise impacts from the Alternative VI Aerial Design Option. (S)*

The United Airlines administration building at the SFIA, approximately 60 feet from the aerial wye-stub, would experience noise levels up to 5 dBA in excess of the 80 dBA criterion. The height difference between Option B and X does not make a measurable difference in noise levels at the building, since the alignment under both options is so close to the building and since a crossover is proposed in the vicinity. These two factors would mask any difference that might otherwise be experienced because of different elevations of the station options and tracks.

MITIGATION MEASURES. Implementation of Mitigation Measure 9.1, i.e., aerial structure sound barrier wall, would reduce this impact to an insignificant level.

12. *BART service into the Airport International Terminal under Option B would not create noise impacts because the operating speeds would be less than 36 miles per hour which would not result in an exceedance of the significance criterion. (I)*

Cumulative Analysis

The same assumptions regarding future traffic volumes, CalTrain service, and SFIA expansion have been used to determine cumulative impacts with the Aerial Design Option as for Alternative VI. These assumptions are presented in Chapter 3, Section 9.2, of the DEIR/SDEIS.

In San Bruno, residences in Lomita Park have the potential to experience cumulative airborne noise impacts from the BART mainline and aerial operations, increased CalTrain service, and background growth in traffic volumes in the vicinity. However, the proposed sound wall to be constructed as part of the Aerial Design Option has the effect of screening these residences from BART and CalTrain noise. The resulting reduction in train noise almost completely offsets projected increase in automobile noise of 3 dBA along San Antonio Avenue. The net effect is an insignificant increase of less than 1 dBA in L_{dn} .

With the minimal increase noted above, the future maximum noise exposure levels from the cumulative projects would range from L_{dn} 67 to 71 dBA in San Bruno and L_{dn} 67 to 70 dBA in Millbrae, which is conditionally satisfactory to generally unsatisfactory according to the applicable community noise elements. These cumulative impacts are less than projected for Alternative VI Tunnel (by 2 to 3 dBA in San Bruno and 1 to 2 dBA in Millbrae). In Burlingame, in the industrial area, the L_{dn} would range from 68 to 73 dBA. The high end of the range would be caused by the nearby crossovers. As industrial uses are not considered sensitive by FTA, this is an insignificant increase. Along California Drive, the future cumulative noise exposure levels would range from L_{dn} 65 to 68 dBA, which is lower than the existing levels. The proposed sound barrier wall to the west of the CalTrain right-of-way would reduce the noise level from CalTrain and hence reduce the noise exposure level in this area. This represents a change of -1 to 0 dB from the existing levels.

The future noise exposure level with BART at SFIA (and no ALRS) would increase by 1 to 3 dBA. The 3 dBA increase would be caused by the crossover near the United Airlines administration building. The ALRS at SFIA may increase the noise exposure level at the United Airlines administration building. Use of steel wheels would increase the level 1 dB, and use of rubber tires would cause no increase. There would be no increase in noise levels at the International Terminal in either case. Future cumulative noise exposure levels with the ALRS and BART, taking into account the future noise contours from the SFIA Master Plan, would increase 3 or 4 dBA for the rubber tire and steel cases, respectively. Office uses are not considered sensitive uses, by FTA, and therefore these increases would not constitute a significant impact.

Section 10

Air Quality

10.1 EXISTING CONDITIONS

The existing conditions discussion presented in Chapter 3, Section 10.1, of the DEIR/SDEIS also applies to the Alternative VI Aerial Design Option.

10.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and evaluate the significance of the Aerial Design Option's air quality impacts are the same as those described in Chapter 3, Section 10.2, of the DEIR/SDEIS.

Project-Specific and Cumulative Analyses

The project-specific and cumulative regional emissions and local carbon monoxide (CO) concentrations associated with the Aerial Design Option would be the same as those described for Alternative VI in Chapter 3, Section 10.2, of the DEIR/SDEIS. These air quality conditions would not change because local traffic conditions (at intersections and parking facilities) and regionally projected vehicle miles traveled (VMT) would be virtually identical between Alternative VI and the Aerial Design Option (see Chapter 3, Section 3.1, Transportation, in this document).

As with Alternative VI, the Aerial Design Option is in conformance with the 1982 Bay Area Air Quality Plan and federal Clean Air Act requirements for transportation projects, based on the U.S. Environmental Protection Agency final conformity rule and MTC Resolution No. 2270. Please refer to Chapter 3, Section 10.1, of the DEIR/SDEIS for further discussion of this issue.

Section 11

Public Health and Safety

11.1 EXISTING CONDITIONS

Information regarding existing conditions related to public health and safety are the same as those described in Chapter 3, Section 11.1, of the DEIR/SDEIS.

11.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The criteria and methodology used to determine and evaluate the significance of health and safety impacts are the same as those presented in Chapter 3, Section 11.2, of the DEIR/SDEIS.

Project-Specific Analyses

The project-specific impacts associated with the Alternative VI Aerial Design Option would be identical to those described for Alternative VI in Chapter 3, Section 11.2, of the DEIR/SDEIS. The location of facilities differs between the two proposals, and a discussion of the effects of alternative locations on public health and safety follows. Because the hazardous materials contamination issue would be addressed in the same fashion for the mainline as for the aerial wye-stub, it is not necessary to distinguish these areas in the following discussion.

1. *By the time BART operations commence in the project corridor under the Aerial Design Option, sites of hazardous contamination identified during Phase I and II hazardous materials site investigations would be remediated or mitigated. Therefore, the risk of exposure to hazardous materials during BART operations would be insignificant. (1)*

As described in the DEIR/SDEIS, BART, as part of its standard operating procedures, would undertake site assessment and characterization prior to construction. If hazardous material contamination were identified during implementation of any of the alternatives, including the Aerial Design Option, BART would be required to remediate or mitigate to an acceptable level, as defined by responsible regulatory agencies, to protect public health and safety, reducing the risk of exposure to hazardous materials during BART operations to an insignificant level. As a result, the public health risk of operating BART service above ground as under the Aerial Design Option versus underground as under Alternative VI Tunnel would be identical.

2. *BART employees, passengers, and land uses near the alignment of the Aerial Design Option would be exposed to electromagnetic fields (EMF) generated by BART facilities. The long-term exposure is expected to be minimal because of the distance to and shielding of EMF sources. The effects of this exposure are not known at this time.*

The location of traction power substations, train control bungalows, and PG&E power feeds are identical under Alternative VI Tunnel and the Aerial Design Option, except for one at the Millbrae Avenue Station. Accordingly, the EMF effects identified for Alternative VI in Chapter 3, Section 11.2, of the DEIR/SDEIS, also apply for the Aerial Design Option except as noted below.

A traction power substation and train control bungalow would be located south of the existing drainage channel and east of the CalTrain right-of-way under the Aerial Design Option, instead of under the proposed elevator portion of Millbrae Avenue under Alternative VI Tunnel. The AC magnetic field from a BART substation would generally drop to ambient levels 14 feet outside the fence perimeter of the substation. For illustration purposes, DC magnetic fields at the fence of the existing Upper Happy Valley BART Substation typically averaged near ambient levels between 400 and 500 mG, but rise to as high as 4900 mG for two to five seconds during the passing of trains. Whether AC or DC magnetic fields strengths in these ranges affect human health has not been determined. The proposed Millbrae traction power station location is approximately 200 feet distant from residences, suggesting that no EMF impacts would occur to these sensitive receptors.

Cumulative Analysis

The cumulative impacts associated with the Alternative VI Aerial Design Option would be identical to those described for Alternative VI in Chapter 3, Section 11.2, of the DEIR/SDEIS.

Section 12

Energy

12.1 EXISTING CONDITIONS

Existing conditions information regarding energy sources, consumption, and regulations is contained in Chapter 3, Section 12.1, of the DEIR/SDEIS.

12.2 IMPACT ASSESSMENT AND MITIGATION

Significance Criteria and Methodology

The significance criteria and methodology for energy-related impacts associated with the Alternative VI Aerial Design Option are the same as those described in Chapter 3, Section 12.2, of the DEIR/SDEIS.

Project-Specific Analysis

The Aerial Design Option would have the same effects as those described for Alternative VI in Chapter 3, Section 12.2, of the DEIR/SDEIS except that the total energy requirement would be higher. The analysis in this section considers the energy requirements of the entire line while other sections of this document focus on differences within the study area. The reason for this difference in approach is that it is impossible to separate out the energy requirements for different segments since the energy requirements also include traction power to operate BART trains and this is a function of BART's systemwide operations plan. Furthermore, meaningful comparisons of the BART energy demands can only be made for an entire project.

1. *The Aerial Design Option would require a total of 560.35 million British thermal units (Btu) per day for station operations, maintenance, and traction power. (I)*

The total electricity demand for the Alternative VI Aerial Design Option of 560.35 million Btu per day includes 6.65 million Btu per day to operate one underground, one at-grade, and one intermodal station; 164.36 million Btu per day for maintenance; and 389.34 million Btu per day to operate the traction power substations. PG&E can accommodate BART energy requirements without affecting the company's ability to supply electricity to its customers (CEC, 1991), and no significant adverse impacts are expected.

Cumulative Analysis

The cumulative effect of the Alternative VI Aerial Design Option would be similar to that presented for Alternative VI in the DEIR/SDEIS, except that BART's contribution to the net regional cumulative energy demand would increase by approximately 189.06 million Btu per day.

Section 13

Construction

This section summarizes the construction process for the Alternative VI Aerial Design Option. Details of construction activities are based on the *Construction Scenario Report for Alternative VI Aerial Wye-Stub Design Option*, dated August 1995, prepared by the Bay Area Transit Consultants. Impacts addressed in this section are directly related to construction activities and are specific to the Aerial Design Option study area. Construction impacts that are identical to those identified for Alternative VI are not reported in this section.

13.1 CONSTRUCTION SCENARIO

This section focuses on construction activities that would differ from those described for Alternative VI in the DEIR/SDEIS. Construction methods for at-grade and below-grade segments of the BART alignment under the Alternative VI Aerial Design Option would be the same as those described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

The Alternative VI Aerial Design Option would run east across SFIA property in an aerial configuration instead of in a tunnel alignment into the airport as described for Alternative VI. The SFIA will design and construct the portion of the BART project located east of the western edge of Highway 101, including the highway overpasses, the station in the International Terminal, and the trackway and support structures. The following preconstruction and construction activities for the aerial wye-stub would pertain to both Options B and X.

While this section presents the most current information available regarding construction methods, activities, and duration, specific construction practices will vary with work area accessibility, soil conditions, proximity of adjacent structures, extent of utilities relocation, traffic control requirements, and permissible noise levels (among other requirements). BART, in conjunction with the design/build contractor, will discuss the construction scenario details with each city and negotiate appropriate methods to minimize impacts.

Preconstruction Activities

Geotechnical Activities. Geotechnical field investigations to assess soil conditions would be necessary to develop preliminary engineering designs. The field investigations would consist of exploratory soil borings and cone penetrometer tests. Proposed test sites would be located primarily along the CalTrain track. The number of the test locations would be minimized to the greatest extent possible and sited to avoid wetlands along the project corridor.

Clearing of Vegetation and SFGS from Construction Sites. It will be necessary to clear all woody vegetation and San Francisco Garter Snake (SFGS) out of a 70- to 100-foot-wide corridor across SFIA property west of Highway 101 prior to initiating construction of the aerial wye-stubs. To assist in the trapping and removal of endangered SFGS from proposed construction sites, temporary exclusionary fencing would surround the construction site prior to any vegetation clearing activities. For further details regarding the clearing of construction site of SFGS, please refer to the Biological Resources discussion in this section.

Heavy equipment with special low-pressure tires or tracks will be used in the clearing and grubbing of woody vegetation within the construction corridor to prevent compaction of wetland soils. The vegetation clearing activities are expected to be completed within a period of approximately three months.

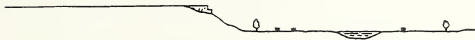
Construction Activities

Temporary Construction Access Roadway. After removing the SFGS and clearing and grubbing vegetation, BART would commence construction. Two alternative methods are being considered for construction of the Alternative VI Aerial Design Option and are described below. These include construction from a roadway earthen berm or from a temporary trestle bridge.

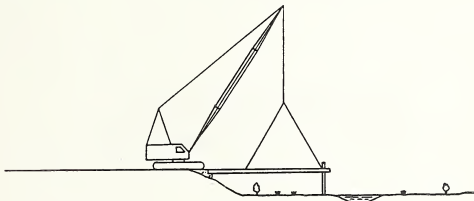
During construction from an earthen roadway berm, surface disturbance would be minimal except in the area temporarily covered with fill material. Two elevated berms paralleling the footprint of the aerial tracks would be constructed, each 40 feet wide at the base. Culverts placed every 50 feet along the base of the berm would allow movement of the endangered SFGS. The berms would be surrounded by a temporary fence that would prevent SFGS from crossing onto the berm. The aerial guideway would be constructed from the berm in the same fashion as from the temporary construction trestle described below. Once construction was completed, the berms would be removed and the disturbed area revegetated.

The temporary construction trestle bridge alternative would allow construction of the aerial wye-structure with minimal surface disturbance. This alternative would increase the Aerial Design Option construction schedule by approximately 50 percent, or six months. Once the construction corridor was fenced and cleared of SFGS and vegetation, two temporary trestles, approximately 30 feet wide each, would be constructed parallel to the footprint of the aerial tracks. The temporary trestles would be supported on pilings driven into the soil and elevated above the ground surfaces to allow for unimpeded movement of water and wildlife during the time the trestles are in place. A platform would be installed on the pilings for the heavy equipment. The temporary exclusionary fencing would be removed after the trestles were complete to allow movement of the SFGS. The construction trestle would remain in place up to 18 months during construction. Figure 3.13-1 illustrates the sequence of the temporary trestle construction.

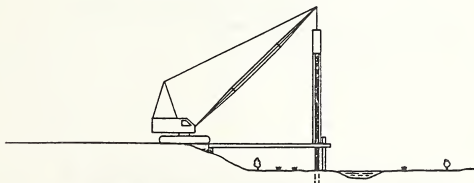
Aerial-Wye Construction. Construction of the BART aerial structure and its support columns would commence from the westerly side of the aerial portion adjacent to the existing tracks and proceed easterly across the SFIA property between the existing tracks and Highway 101. All excavated material would be removed and disposed offsite. The aerial structure would be supported by specially designed support columns or pillars spaced an average of 80 feet apart, with caisson foundations supporting the columns. The concrete caps on top of the caissons and below the columns would be constructed below the existing ground surface.



Step 1: Construct Launching Ramp



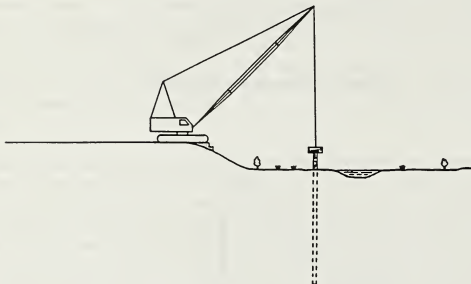
Step 2: Place Pile Template



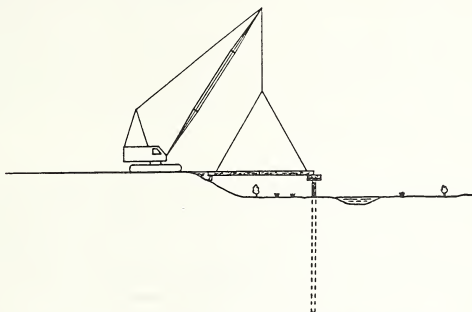
Step 3: Drive Temporary Trestle Support Piles



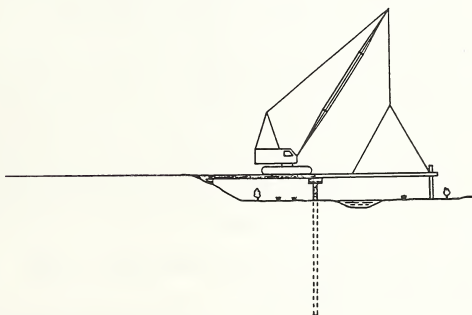
Step 4: Remove Pile Template



Step 5: Place Temporary Trestle Pile Cap



Step 6: Place Temporary Trestle Girders



**Step 7: Move on to Temporary Trestle Span
and Repeat Steps 2 through 6**

After the erection of the foundations and support columns, the aerial structure girders would be set in place. Girders would be prefabricated at the contractor's laydown area and rolled to their location on special dollies designed for use on the temporary trestle. Cranes located on the temporary berm or construction trestle, depending upon the construction method chosen, would lift the girders from the dollies and fix them in place upon the columns. An optional technique for installing girders may include precast, segmented concrete construction in this area. Figures 3.13-2 illustrates the sequence of operations during the aerial structure construction as envisioned for the berm or trestle construction alternatives. The height of equipment used during construction of the aerial structure is within the height limitations set by the FAA for safety consideration.

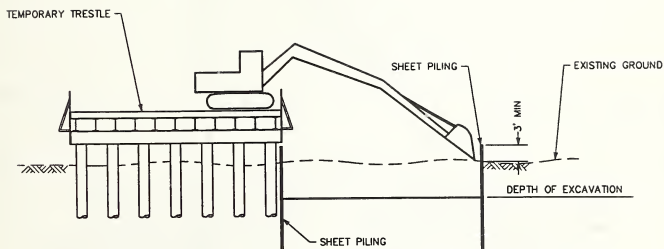
Aerial Structure over Highway 101. The aerial portion within the Highway 101 right-of-way would be constructed in a traditional fashion, concurrent with the construction of new highway ramps into and out of the SFIA as called for by the SFIA Master Plan. The traffic lanes adjacent to column locations would be redirected slightly to allow working space at column footing locations with temporary concrete barriers (K-rail) and temporary traffic lane restriping. Caissons for the columns would be installed and covered at their tops with a concrete cap located below the existing surface of the highway. After columns had been constructed, prefabricated structural girders would be lifted to the tops of the columns and secured. The BART deck would then be built on top of the girders, followed by the trackwork, traction power, train control, and communication facilities. The number of lanes in each direction would be maintained, except during the actual placement of the prefabricated girders. The placement of girders spanning the northbound lanes would require that those lanes be diverted for two nights between the hours of 11:30 P.M. and 4:30 A.M. A similar diversion would take place over the southbound lanes.

Aerial Structure in the San Francisco International Airport. The remainder of the aerial wye-stub would be located on SFIA property and would be built using conventional construction techniques, as described in the DEIR/SDEIS. Construction of this portion of the Aerial Design Option would be coordinated with construction of the SFIA improvements, including the Ground Transportation Center, new access ramps to Highway 101, the Airport International Terminal Station, and the ALRS. If the Aerial Design Option were selected, BART proposes that the SFIA design and construct the portion of the alternative located east of the western edge of Highway 101 to ensure that construction does not interfere with or cause delay to proposed SFIA Master Plan projects. This portion of the Aerial Design Option includes the highway overpasses, the station at the planned International Terminal, and the trackway and supporting structures.

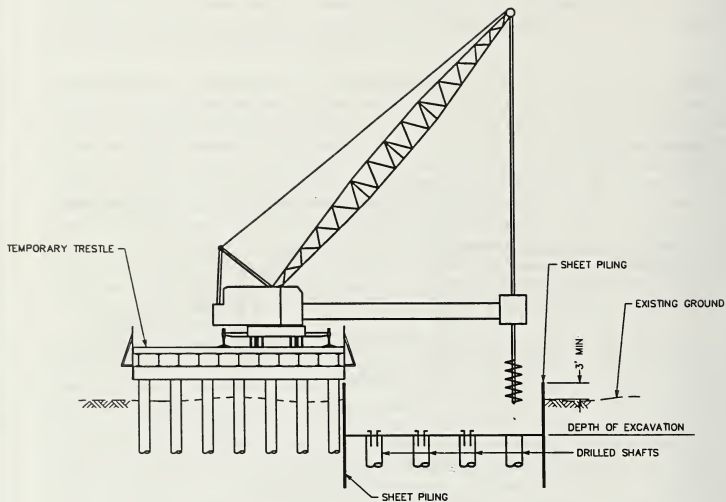
Contractor's Storage Yards and Staging Areas

San Bruno Yard. Construction of the BART mainline from Angus Avenue to just north of Center Street, and the aerial structures between the mainline and the west side of Highway 101, would be supported from one of three temporary storage yard and staging area alternatives located in the vicinity of Belle Air Elementary School in San Bruno, as shown in Figure 3.13-3. These storage yards are unique to the Aerial Design Option.

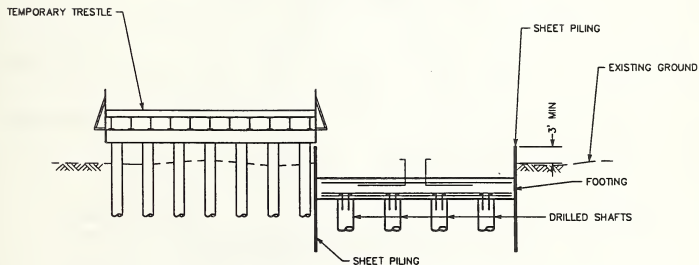
Alternative A is approximately 1.4 acres and would be located at the community gardens south of Lion's Field Park. Construction truck traffic would be routed along 1st Avenue to San Mateo Avenue to Highway 101. Selection of this route is subject to agreements with local authorities prior to the start of construction. The distance between this yard and the work area is approximately 0.6 miles.



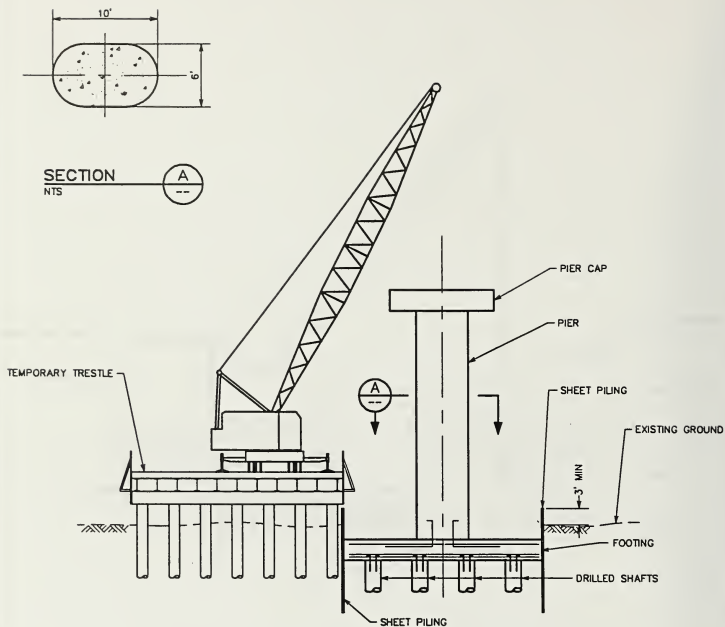
Step 1: Install Sheet Piling and Excavate for Footing



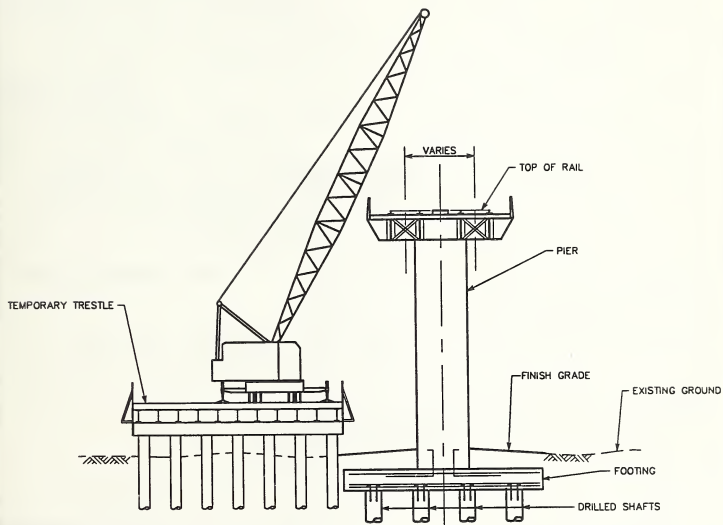
Step 2: Install Drilled Shafts



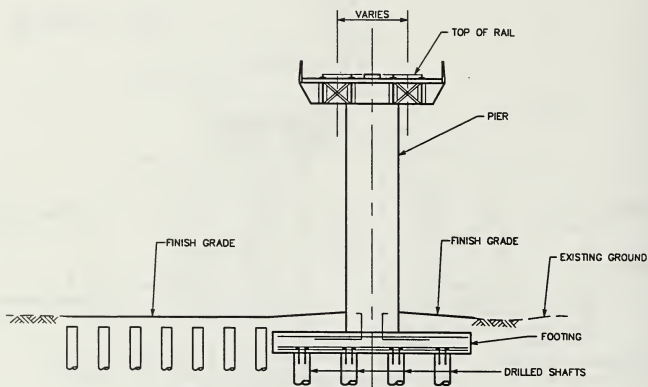
Step 3: Construct Footing



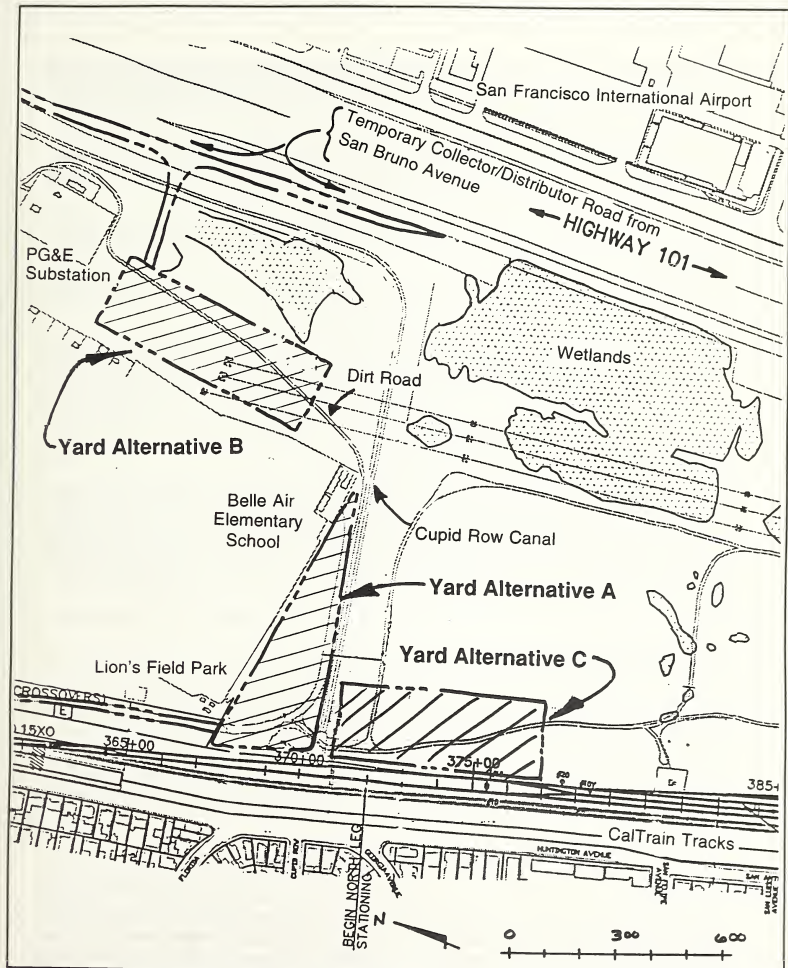
Step 4: Construct Pier and Structural Steel Pier Cap



Step 5: Construct Superstructure and Install Rails, Traction Power, Control and Communication Systems



Step 6: Remove Trestle and Restore Site



Alternative B is approximately 3.0 acres and would be located east of Belle Air Elementary School in the open area just south of the existing overhead PG&E transmission lines. This yard and staging area would be accessed by workers and supply trucks via a new, temporary road connecting to the San Bruno Avenue interchange by way of an existing Caltrans road along the westerly side of Highway 101. This existing road has ample area along the west side for the construction of temporary deceleration and acceleration lanes required for access to the yard. The distance between this yard and the work area is approximately 0.7 miles. The site would be developed to avoid willows and seasonal wetlands in the area.

Alternative C is approximately 3.0 acres and would be located in the undeveloped upland area west of Highway 101, just south of the Cupid Row Canal and just east of the existing CalTrain tracks and proposed BART mainline, as shown in Figure 3.13-3. This site could be accessed by workers and trucks traveling either through San Bruno (as under Alternative A) or via the proposed connection to the existing Caltrans road along the west side of Highway 101 (as under Alternative B).

Millbrae Avenue Station Yard. Construction of the remainder of the mainline from just north of Center Street to north of the Millbrae Avenue Station would be supported from a storage yard and staging area at the site of the Millbrae Avenue Station. All construction traffic would be routed over the BART mainline track bed between the yard and the construction area. Traffic between the yard and the work area would pass the Bayside Manor, Millbrae Manor, Marino Vista, and North Millbrae neighborhoods. The distance between this yard and the work area is approximately 0.7 miles.

Highway 101 and Airport Yards. Both the Highway 101 crossing and the aerial structure within the SFIA property would be constructed by SFIA contractors in conjunction with other related SFIA Master Plan construction. Construction activities for the Highway 101 crossing and all work within the SFIA property east of Highway 101 would be supported from contractor's storage and laydown areas located within the SFIA property east of the highway. After the aerial structure has been completed, BART contractors would install the trackwork, traction power and train control facilities, and complete the SFIA station.

PG&E Transmission Lines

The BART aerial tracks over the SFIA property west of Highway 101 would conflict with PG&E's existing overhead 115 kV transmission lines. The existing lines are currently constructed to the "minimum ground clearance," which means that the lowest point of the bottom conductor is approximately 30 feet above the ground. Since the aerial BART tracks would conflict with PG&E's existing 115 kV overhead transmission lines, the lines would have to be relocated. Two options are being evaluated by PG&E for relocating the transmission lines: relocating the lines underground and relocating the lines over the BART aerial structure.

In order to relocate the transmission lines underground, it would be necessary to build two dead-end towers approximately 1,000 feet apart. Three construction methods for relocating the transmission lines underground are being considered: directional drilling, jack and bore, and trenching. Both the directional drilling and jack and bore methods would limit disturbances to areas around the new towers. The drilling and jack and bore techniques would require two working areas, approximately 100 feet wide by 150 feet long, at the base of each new dead-end tower to install drilling equipment. All directional drilling and jack and bore construction, demolition of the existing towers, and erection of the new towers would be

performed within the PG&E easement work areas. The work areas would be accessed from the north at 1st Avenue via existing dirt roads. The trenching method would require an open cut, which would disturb more area than that of the other two methods.

Relocating the transmission lines over the BART aerial structure would also require new towers approximately 1,000 feet apart within the SFIA property west of Highway 101. A shoofly, or temporary transmission line, would have to be constructed while the transmission lines were being relocated to minimize electrical service disruption. Relocation of the PG&E overhead lines would be completed prior to the start of any work on the aerial structure and would require approximately four months of onsite construction activity.

Right-of-Way

A permanent easement the width of the BART aerial structure and maintenance easements 10 feet wide along each side of the structure would be required for the long-term operation of the Aerial Design Option. Permanent maintenance roads would not be placed in any of the wetlands. The majority of maintenance for the BART aerial structure and associated operating controls would be accomplished by specially constructed vehicles that ride atop the aerial structure.

For the mainline portion of the route, fee title would be required for the land, from a point approximately midway between the existing CalTrain tracks and the new BART tracks to a point 15 feet outside the centerline of the easterly BART track. An additional 10 feet of temporary easement along the easterly side of the new mainline right-of-way would be required for the construction period. Most of this right-of-way and easement property would be acquired from the existing Peninsula Corridor Joint Powers Board (JPB) right-of-way. Additional right-of-way and easements east of the JPB property would be obtained from the SFIA.

Construction Activity Volumes

The volume of construction truck traffic, labor hours, and operating hours were estimated based upon the quantities of required construction materials and other activities contained in Appendix B of the *Construction Scenario Report*. Table 3.13-1 in this document provides a summary of construction activities for major phases of the construction effort for the entire project corridor. Table 3.13-2 presents the same information for the Aerial Design Option study area only. Truck activity includes removal of brush, trees and excess excavated earth; delivery of ready-mix concrete, reinforcing steel, and other construction materials; and delivery of ballast ties, rail and other railway construction materials. The equipment operation hours represent only the time during which large internal-combustion engines are being utilized. Small equipment, such as concrete vibrators and hand-held compactors, are not included. Key data from Table 3.13-2 are presented for each of the four basic work activity area in Table 3.13-3.

Construction Schedule

Construction of the Alternative VI Aerial Design Option would take approximately 45 months to complete, including system testing. Construction would require one eight-hour shift per day, five days per week for the majority of the work period. Some critical activities may require longer working hours per shift, in addition to Saturday or evening/late night shifts.

Table 3.13-1
Alternative VI Aerial Design Option within the Project Corridor
Construction Quantities by Phase

Item	Duration (days) ¹	Person Hours	Earthwork Cubic Yards ²	Number of Trucks ³	Equipment Hours ²	Equipment/Comments
Utility	-	1,966	-	-	12,100	Backhoe, 2 Dump Trucks, Pickup
Roadway	-	352,434	-	-	52,600	Motor Grader, Loader, 4 Dump Trucks
Earthwork	-	215,135	1,312,400	70,383	132,100	Dozer, Motor Graders, Scraper, 29 Dump Trucks, Roller, Power Shovel, 6 Water Trucks, Pickup
Structures	-	3,285,936	-	-	284,600	Conveyor, Ventilator, Jacks, Cranes, Generator, Drill Rig, Tank Truck, Pump, 14 Cranes, 4 Concrete Trucks, Concrete Pump, 4 Pickups, Special Truck, Power Tools, Pile Hammer, Air Compressor, Fork Lift, Backhoe, Dump Truck, Welder
Trackwork	-	193,061	-	-	20,200	5 Pickups, 2 Tamper Liners, 5 Loaders, Roller, 28 Dump Trucks, Backhoe, Ballast Profiler, Track Welding Plant, Welder
Stations/Systems	-	1,129,641	-	-	1,700	Crawler Crane, Hydraulic Crane, Concrete Slipform Paver
Totals	-	5,178,173	1,312,400	70,383	503,300	

Source: *Construction Scenario Report for Alternative VI Aerial Wye-Stub Design Option* (August 1995)

- 1) The duration for all construction activities is estimated to be approximately 45 months.
- 2) Rounded to the nearest 100.
- 3) All trucks reported for earthwork activities, although some trucks would be used for other construction phases.

Table 3.13-2
Alternative VI Aerial Design Option within the Study Area
Construction Quantities by Phase

Item	Duration (days) ¹	Person Hours ²	Earthwork Cubic Yards ²	Number of Trucks	Equipment Hours ²
Utility	260	4,500	—	—	500
Roadway	-	—	—	—	—
Earthwork	275	285,000	355,000	18,700	62,300
Structures	575	666,000	—	18,000	109,400
Trackwork	340	35,000	—	100	3,700
Stations/Systems	900	317,500	—	350	29,900
Totals	2,350	1,308,000	355,000	37,150	205,800

Source: Construction Scenario Report for Alternative VI Aerial Wye-Stub Design Option (August 1995)

- 1) Longest activity under subheading reported here. It is assumed activities with shorter time frames would run concurrently.
The duration for construction activities represents the total time to be spent; "actual" duration would be less since there would be multiple crews working to simultaneously complete these tasks.
- 2) Rounded to the nearest 100.

**Table 3.13-3
Alternative VI Aerial Design Option within the Study Area
Construction Quantities by Work Area**

Work Area	Description	Truck Volume (trips)	Person Hours	Equipment Hours
San Bruno Yard	The San Bruno Yard covers all labor and construction equipment operation associated with the construction of the BART mainline from the vicinity of Angus Avenue to just north of Center Street, and includes the aerial structures between the mainline and the westerly side of Highway 101 and includes dozers, graders, trucks, cranes, compressors, and concrete pumps.	14,400	205,000	91,000
Millbrae Yard	The Millbrae Yard covers all labor and construction equipment operation associated with the construction of the BART mainline from just north of Center Street to the vicinity of Isabel Alley just north of the Millbrae Avenue Station and includes dozers, graders, trucks, cranes, compressors, and concrete pumps.	16,000	323,000	66,000
Highway 101	The Highway 101 Volumes cover all labor and construction equipment operation associated with the construction of the BART aerial structures across Highway 101 just west of the entrance to the SFIA, and includes trucks, backhoes, cranes, compressors, and concrete pumps.	600	38,000	6,500
SFLA	The SFIA Volumes cover all labor and construction equipment operation associated with the construction of the BART aerial structures located inside the SFIA property east of Highway 101, and includes trucks, backhoes, cranes, compressors, and concrete pumps.	6,100	480,000	41,500
		37,100	1,046,000	205,000

13.2 IMPACT ASSESSMENT AND MITIGATION

Transportation

The transportation construction impacts and mitigation measures would be the same under the Alternative VI Aerial Design Option as those described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS, with the following differences (which would occur under both Option B and X). Impact 1, below, replaces Impact 15 for Alternative VI in Chapter 3, Section 13, in the DEIR/SDEIS.

1. *The addition of construction vehicles on surface streets would impact traffic circulation. (I)*

The number of daily truck trips under the Aerial Design Option would be greater than the number under Alternative VI, although the construction period would be shorter. As a result, construction traffic impacts under the Aerial Design Option would not occur for as long a period as under Alternative VI. Excavation for the tunnel segment under Alternative VI would require a longer period of time than construction of the aerial wye-stub because the tunneling machine would be constrained to digging one surface at one location, whereas work on the aerial wye-structures could occur simultaneously at more than one location.

The removal of excess earth for the subway and retained cut segments of the Aerial Design Option would require an average of five to ten trucks per hour, with the peak number between ten and 15 trucks per hour. The daily number of trucks under this scenario would be between 50 and 80 trucks, continuing six to seven months during excavation. In addition, the large concrete pours would require approximately ten trucks per hour over an eight- to 12-hour period, or between 80 and 120 trucks per day. These concrete pours would occur for approximately two days per week over a period of ten to 11 months. The remaining truck traffic for delivery of various construction-related materials would range from approximately one to five trucks per hour. Excavation activity would occur before the beginning of the concrete pours, and the two activities would only overlap for two to three weeks.

Laydown yard Alternative A would be immediately south of Lion's Field and would require use of local streets for truck haul routes. To access the freeway from this staging area, trucks could travel north on 1st Avenue and northeast on San Mateo Avenue to Highway 101, a shorter route than proposed under Alternative VI. Haul routes will be coordinated and predetermined by agreements with local authorities prior to construction. Truck volumes at these locations would not significantly impact the level of service at local intersections.

With yard Alternative B, potential impacts could occur at acceleration/deceleration points where construction vehicles would enter/exit Highway 101. Alternative C could be accessed in a fashion similar to either Alternative A or B. Accordingly, traffic impacts associated with Alternative C would be similar to either Alternative A or B, depending on the selected access route.

MITIGATION MEASURES. The same mitigation measures recommended for Alternative VI, i.e., designation of construction vehicle routes within BART right-of-way, coordination of vehicle routes with local jurisdictions, additional traffic control, and temporary acceleration/deceleration

lanes, apply to the Aerial Design Option. Although this impact would be insignificant, the following additional recommendation is suggested to further reduce potential impacts. This measure would not be required if Mitigation Measure 1.1, i.e., temporary road and wall construction, recommended in the Construction/Noise and Vibration discussion of this section were implemented within the BART right-of-way, or if yard Alternative B were selected.

- 1.1 *Restrict Parking to One Side of 1st Avenue during Construction at the San Bruno Laydown Yard.* Parking could be prohibited along the west side of 1st Avenue, next to the CalTrain mainline tracks between Lion's Field and San Mateo Avenue, dependent upon agreements with local authorities. This restriction would occur during the two years of construction activity at yard Alternative A or C (if the same access route is chosen for Alternative C as is proposed for Alternative A). The additional operating width on 1st Avenue would permit continuous flow of two-way traffic during the construction period.
2. *Construction of the aerial wye-stub alignment over Highway 101 would not significantly impact freeway traffic or disturb circulation at the SFIA. (I)*

Lane restriping on the freeway would be necessary to accommodate construction of the piers and foundations. Temporary barrier rails would be installed on the freeway to separate construction areas from freeway traffic. Both of these activities would restrict and/or impede traffic flow along Highway 101, causing congestion and travel delays in the vicinity of the SFIA. In addition, these construction activities would interfere with access into and out of the SFIA. In recognition of these potential effects, BART proposes to perform construction of the Highway 101 crossing between 11:30 P.M. and 4:30 A.M. to minimize the effect on peak-hour freeway travel and airport access. Because traffic during these hours is light, disruption of Highway 101 traffic and SFIA access would be insignificant. Construction of the aerial wye-stub alignment on SFIA property east of Highway 101 would not significantly affect traffic circulation on airport roadways.

Land Use

Land use construction impacts would be the same as those described under Alternative VI in Chapter 3, Section 13, of the DEIR/SDEIS, with the following differences.

1. *Construction activities at the contractor laydown areas in San Bruno would disrupt adjacent neighborhoods. (S)*

Laydown yard Alternative A would displace the community gardens located immediately south of Lion's Field Park. Loss of this neighborhood/community area would constitute a significant land use and neighborhood impact.

MITIGATION MEASURES. The only measure available to reduce this impact to an insignificant level would be to select Alternative B or C for a laydown and staging area.

2. *Construction activities at laydown yard Alternative A and associated truck trips would disrupt the Belle Air neighborhood in San Bruno. (S)*

Under the Alternative VI Aerial Design Option, the Belle Air neighborhood would be affected by approximately 14,400 truck trips that would generate noise, dust, and potential safety hazards. Construction mobilization under Alternative A or C and their respective haul routes would disturb Belle Air residents, especially those along 1st and Angus Avenues and students walking to and from Belle Air School. In addition, yard Alternative A would adversely affect use of Lion's Field Park. Impacts to the park resulting from adjacent construction are discussed in Chapter 5, Section 4(f) Evaluation.

Alternative B would also disrupt residents in the Belle Air neighborhood, but the traffic, noise, and dust effects would be restricted primarily to the homes along 7th Avenue and to Belle Air Elementary School.

MITIGATION MEASURES. The same mitigation measure recommended for Alternative VI, i.e., coordination with cities, communities, and schools, applies to the Aerial Design Option. In addition, Mitigation Measure 2.1, below, and Mitigation Measure 1.1, i.e., temporary road and wall construction, recommended in the Construction/Noise and Vibration discussion of this section would reduce San Bruno neighborhood impacts to an insignificant level.

2.1 *Traffic Control.* BART, in consultation with the City of San Bruno, will work cooperatively to ensure that traffic control is provided in the vicinity of the Belle Air Elementary School during school hours and officially-sanctioned recreational activities at Lion's Field. The dates and times of these recreational activities at Lion's Field must be provided to designated BART staff at least 48 hours in advance of the activity to allow proper scheduling of traffic control measures.

3. *Approximately 16,000 truck trips in the vicinity of Millbrae Avenue Station would potentially affect residents along Hemlock Avenue and in the Bayside Manor, Marino Vista, and North Millbrae neighborhoods. (S)*

Mobilization activities from the Millbrae yard would disturb residents between the Millbrae Avenue Station and Center Street. Although the CalTrain right-of-way would be used for construction, it is adjacent to homes in Marino Vista, North Millbrae, Bayside Manor, and Millbrae Manor and would adversely affect this stretch for approximately 45 months.

MITIGATION MEASURES. The same mitigation measure recommended for Alternative VI, i.e., coordination with cities, communities, and schools, applies to the Aerial Design Option. In addition, Mitigation Measure 2.1, above, and Mitigation Measure 1.1, i.e., temporary road and wall construction, recommended in the Construction/Noise and Vibration discussion of this section would reduce Millbrae neighborhood impacts.

- 3.1 *Temporary Visual and Noise Barriers.* BART will construct temporary sound and visual barriers along the east and west perimeters of the work area to reduce noise impacts to or below BART's proposed project construction noise criteria. Implementation of this measure would result in a temporary, significant visual impact because of its proximity to homes and the sense of enclosure the walls would create.

Visual Quality

Visual impacts resulting from construction activities under the Alternative VI Aerial Design Option would be the same as those described under Alternative VI in Chapter 3, Section 13, of the DEIR/SDEIS, with three exceptions described below.

Mainline through San Bruno, Millbrae, and Burlingame

1. *Laydown and staging areas being considered for the construction of the Aerial Design Option would alter the visual setting by removing existing trees. (S)*

Loss of trees would alter the visual setting and quality of the views. Selection of Alternative A would not result in the removal of existing trees. In contrast, selection of Alternative B would result in the clearing of some willows and selection of Alternative C would result in the removal of eucalyptus trees along the east side of the CalTrain tracks. The effect of Alternative B would be insignificant because these trees are located sparsely along some of the backyards of Belle Air residences that front onto 7th Street and thus do not contribute significantly to prominent views or streetscape. The effect of Alternative C, however, would be noticeable and significant because the tall eucalyptus that would be removed are considered a local scenic resource and contribute to the high quality streetscape along this segment of Huntington and San Antonio Avenues.

Other visual impacts resulting from the three optional contractor laydown yards in San Bruno would be insignificant. In the case of Alternatives A and C, the laydown areas are greater than 200 feet from the nearest residence and would not obstruct significant views. Laydown yard Alternative B would be located in an area marked by overhead transmission lines, the PG&E Airport Substation, and would be visible predominantly from Highway 101 and by residences along 7th Avenue in the Belle Air neighborhood. In this context, visual impacts would be insignificant.

The visual effects of the Millbrae Avenue Station yard would be the same as those described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

MITIGATION MEASURES. After construction of the landscaped sound wall, the loss of trees with Alternative C would be reduced to an insignificant level; however, in the interim, their removal would be a short-term significant and unavoidable impact. This can be avoided by selecting either of the other two optional laydown yards and staging areas.

2. *Construction of the sound wall along the at-grade portion of the BART mainline under the Aerial Design Option would adversely affect close-up views and create a sense of encroachment. (S)*

Construction of at the at-grade sound wall between a point just north of San Felipe Avenue and approximately 300 feet north of Madrone Street in Millbrae would occur within 60 feet of identified sensitive receptors in several communities within the study area. This proximity to construction activities would adversely affect close-up views and may create a sense of encroachment and thus loss of privacy for residences in the Lomita Park and Airport Park neighborhoods.

MITIGATION MEASURES. No feasible mitigation exists to reduce impacts to sensitive receptors. The construction-period impacts to sensitive receptors would be significant and unavoidable.

Aerial Wye-Stub to the SFIA (Options B and X)

3. *Scenic resources, including the open space area west of Highway 101 and identified travel corridors with high-quality streetscapes, would be impacted by construction activities under the Alternative VI Aerial Design Option. (S)*

Construction activities for the aerial tracks would detract from views of the open space area west of Highway 101 and San Bruno Mountain beyond from the Lomita Park and Marino Vista neighborhoods.

MITIGATION MEASURES. No feasible mitigation exists to reduce these impacts to scenic resources and views. These construction-period impacts would therefore be significant and unavoidable.

Cultural Resources

The Alternative VI Aerial Design Option would result in the same impacts to cultural resources as those described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

Community Services

Construction of the Alternative VI Aerial Design Option would potentially delay response times for local police, fire, and emergency medical service providers to the same degree as that described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

Utilities

Impacts to utility services would be the same under the Alternative VI Aerial Design Option as those described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS, with one exception. Since the aerial BART tracks would conflict with PG&E's existing 115 kV overhead transmission lines, the lines would have to be relocated. Two options are being evaluated by PG&E for relocating the transmission lines: relocating the lines underground and relocating the lines over the BART aerial structure. Relocating the existing overhead transmission lines would not create additional service disruptions beyond those identified for Alternative VI Tunnel.

Geology, Soils, and Seismicity

Construction under the Alternative VI Aerial Design Option would create fewer geology, soils, and seismicity impacts than under Alternative VI Tunnel. Since the alignment would cross the SFIA property west of Highway 101 in an aerial configuration, tunneling impacts would not occur. Construction of the aerial support columns across SFIA property would require pile driving, but would not result in geology, soils or seismicity impacts. Geotechnical exploratory methods are unobtrusive and would cause little or no ground disturbance. Impacts related to construction of the retained cut and cut-and-cover segments of the alignment between Angus Avenue in San Bruno and the Millbrae Avenue Station would be the same as those identified for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

Biological Resources

No biological impacts would be associated with the station location inside the airport under Options B or X, since this area is heavily urbanized. Construction-related impacts on aquatic habitats identified in the DEIR/SDEIS for Alternative VI Tunnel, including impacts from dewatering of excavation sites and degradation of aquatic habitat quality due to soil erosion of disturbed sites would also occur under the Aerial Design Option. Impacts associated with additional construction access points from outside the construction easement identified for Alternative VI, however, would not apply to the Aerial Design Option. The Aerial Design Option construction access would be from the north at 1st Avenue and from the south at the new Millbrae Avenue Station site. Impacts to biological resources on the west of Bayshore parcel associated with the Aerial Design Option would be greater than those identified for Alternative VI in the DEIR/SDEIS. These impacts and proposed mitigation measures are discussed below.

Mainline through San Bruno, Millbrae, and Burlingame

1. *The preconstruction geotechnical field investigations would temporarily disturb a minimum of approximately 0.18 acres of habitat on or in the immediate vicinity of the west of Bayshore parcel. (S)*

BART must conduct geotechnical field investigations, consisting of exploratory soil borings and cone penetrometer tests, to obtain soils information required to properly design the foundations for the aerial structure. The design of the structure foundations in the area between the CalTrain mainline and Highway 101 (west of Bayshore parcel) is especially important because of the liquefaction potential of the loose alluvial soil upon which the aerial structure will be built (see Section 3.6, Geology, Soils and Seismicity, in this chapter for more details). The field investigation program has been designed to minimize the number of test locations to the greatest extent possible and to avoid wetlands in locating test sites.

The exploratory soil borings would be 8 inches in diameter and approximately 100 feet deep. The equipment would consist of a single-axle, four-wheel drive truck upon which the drilling equipment would be mounted and a smaller water truck or trailer. This heavy equipment and associated construction materials (plywood staging, plastic ground cover, etc.) would cover an area of approximately 10 feet by 30 feet (approximately 300 square feet) at each drill site. With a minimum of 14 potential soil boring locations planned for these field investigations on or in the immediate vicinity of the west of Bayshore parcel, the program would temporarily disturb approximately 4,200 square feet or 0.10 acres of SFGS upland habitat. Additional impacts to upland areas would occur associated with offroad vehicle access to and from specific test sites. Completion of each boring is not expected to take more than one day, or six to eight hours, and the entire field investigation in this area is not expected to take longer than 16 days, barring adverse weather conditions. Noise associated with this activity would be similar to levels produced by a small backhoe or tractor and would occur for a majority of the time the soil boring was in progress.

Subsurface soil samples would be taken at selected times during the soil boring process. The sample tube would be driven into the soil with a hammer device and thus result in noise levels similar to those of a sledge hammer striking a metal plate. All excess drill cuttings would be collected and disposed offsite. Some of the bore holes would have PVC casings installed for

monitoring groundwater. Upon completing the testing and monitoring, all the holes would be backfilled to the ground surface with cement/bentonite grout.

The cone penetrometer test holes would be 2 inches in diameter and approximately 100 feet deep. The test equipment would be mounted on a vehicle similar to the one described above; however, the noise produced by this piece of equipment would be somewhat lower (equivalent to a standard small truck), and each test would require no more than 1 hour to complete. These tests would be conducted at the same time the soil borings are completed. A minimum of 14 cone penetrometer tests are planned for the mainline route in the vicinity of the west of Bayshore parcel. The total area of ground disturbance at each test site would be slightly smaller than at the soil boring sites, and is estimated at approximately 240 square feet. The minimum 14 test sites would disturb approximately 3,360 square feet, or 0.08 acres of upland habitat on or in the immediate vicinity of the west of Bayshore parcel. As with the soil test borings, additional impacts to upland areas associated with vehicle offroad access to and from the specific test sites would occur.

MITIGATION MEASURES. Although the geotechnical field investigation program has been designed to minimize site disturbances to an absolute minimum, disturbances to upland habitats are unavoidable. Given the sensitivity of the west of Bayshore parcel, the following mitigation measure is designed to further reduce or minimize the impacts to an insignificant level.

1.1 *Development of and Implementation of a Biological Monitoring Plan.* A Biological Monitoring Plan will be developed and approved by the USFWS, CDFG, BART, and the geotechnical contractor. Elements of this plan will include the following:

- Identification of the required qualifications of the Biology Monitor.
- Identification of the responsibilities of all involved in the field investigation and monitoring effort. (This would include a description of assignments, responsibilities, and reporting procedures in the event of a significant problem or potential problem, such as in the event an SFGS should be found at a test site, injured, or killed during the field investigation).
- Definition of acceptable operating procedures. (These procedures would be designed to minimize disturbances, including access and travel on the west of Bayshore parcel, disposal of waste, handling of fuels and water, operation procedures at each drill site to minimize ground disturbances, operational safety feature, site security, and proper means of filling the holes).
- Development of environmental awareness training program for the field crews to inform them of their responsibilities and the sensitivity of the resources.
- Definition of procedures for the environmental monitoring.
- A Site Restoration Plan, including an active revegetation program and suitable soil erosion control measures. (For the most part, reclamation of the test sites should be performed during the field investigations with implementation of the measures noted above. However, a restoration plan will be prepared before the field investigations are initiated to assure that investigations do not leave the site disturbed. This plan will be approved by the USFWS, CDFG, BART, and the contractor).
- An Emergency Response Plan. (This plan will identify what types of events could require emergency response, such as the accidental death of an SFGS due to the field

investigations, or some unexpected level of disturbance due to an accident or equipment failure).

2. *Preconstruction activities would involve removal of trees and vegetation within the construction easement and in the Alternative B or C storage yard and staging areas. (S)*

Clearing woody vegetation would result in the removal of nearly all the eucalyptus trees east of the CalTrain tracks for the mainline and the Alternative C storage yard and staging area. Although these trees provide some habitat for nesting bird species, in particular raptor species, eucalyptus trees are not native to California and preclude the development of undergrowth and more productive habitat. The only raptor bird species observed on the west of Bayshore parcel associated with these trees are a pair of red-tailed hawks (assumed nesting) and a sharp-shinned hawk in the winter. These bird species are common in the area and thus the loss of this habitat for these birds is not considered significant. In fact, the removal of the trees may enhance the development of wetland vegetation along San Felipe Canal, which now has very little ground cover under the eucalyptus trees. The removal of these trees would have a visual impact, which is discussed in the Visual Quality section of this chapter.

The removal of some of the acacia trees west of the CalTrain tracks is not considered significant because, just as with the eucalyptus trees, these trees are also non-native and provide limited habitat value.

Some willow trees within the seasonal wetlands in the Alternative B storage yard and staging area and proposed access route to Highway 101 would have to be removed to accommodate these project features. In addition, a portion of the blackberry thicket next to the South Lomita Canal would have to be removed to accommodate the mainline construction in this area. The removal of the willows and blackberry thicket is significant because it represents a loss of important cover habitat (hibernacula) for the SFGS. A more detailed discussion of the impact and associated mitigation measures for the blackberry thicket are presented under Impact 4, below. Suitable mitigation measures for the removal of the willow trees are presented below.

MITIGATION MEASURES. The following mitigation measures would reduce the identified impact to the willows to an insignificant level. The first mitigation measure is preferred. However, if the first measure were infeasible, then the second measure would be implemented.

- 2.1 *Selection of Alternative B or C or Redesign of Alternative A to Avoid Wetlands.* The need to remove and clear the willows associated with the Alternative B storage yard and staging area can be avoided if either Alternative A or C were used, and the access route for Alternative C is via the surface streets of San Bruno. However, if Alternative A or C is infeasible and Alternative Site B is required, the identified impacts to the willows and wetlands could be avoided if the Alternative B storage yard and staging area were reduced in size and the access route modified. To avoid the wetlands contained within proposed Alternative B, this site should be reduced approximately 350 feet from the north to just south of the PG&E transmission towers. To avoid the willows and seasonal wetlands along the proposed access route for Alternative A and C, all access to the construction storage yard and staging area would be directed through the existing city streets, as under Alternative A. This modification

of the access route would result in additional noise and traffic impacts to the adjacent community.

2.2 *Restoration of the Disturbed Wetland Sites.* After construction is completed, the willow trees could be restored to the site. A restoration biologist would prepare and implement a restoration plan for this site.

3. *Construction of the mainline portion of Alternative VI Aerial Design Option would disturb all biotic resources within the proposed construction right-of-way, including approximately 0.70 to 1.50 acres of wetlands, depending upon the alternative construction storage yard and staging area selected. (S)*

A construction right-of-way has been designed to allow for adequate work space, as well as to minimize disturbances in this highly sensitive area. It is assumed that movement of construction equipment would occur throughout the right-of-way, except where otherwise described; thus, construction activities would disturb approximately 0.70 to 1.50 acres of wetland and creekside habitats that currently exist within the construction right-of-way. These wetland types vary from intermittent creeks and drainages to large drainage canals that carry water year-round, and include the following:

Cupid Row Canal. The construction right-of-way in the area of Cupid Row Canal includes a short reach of this canal (approximately 70 feet in length) east of the existing bridge and access road into the west of Bayshore parcel and west of the CalTrain tracks. The eastern reach of the canal supports approximately 1,000 square feet (0.024 acres) of wetlands within its banks. The western reach supports slightly less wetland habitat, approximately 700 square feet (0.016 acres). Disturbances to these areas would be significant, since the California red-legged frog and San Francisco forktail damselfly were found in this area, and very possibly the endangered SFGS could utilize these habitats.

Small Drainage Ditch. There is a small drainage ditch with associated wetland habitats extending from the southeastern corner of the San Bruno CalTrain Station parking lot south to Cupid Row Canal. The entire length of this ditch (approximately 600 feet) lies within the project permanent and construction easements in this area. The construction drawings show that this ditch is to be relocated, but do not indicate where it is to be relocated. For the purposes of this analysis, it is assumed that during construction of this cut-and-cover section of the track alignment that the ditch would be diverted to the east outside or at the edge of the construction easement, and then restored when project construction is completed to near its current location. This action would disturb approximately 4,200 square feet (0.096 acres) of wetland habitat associated with this ditch. Although the wetland habitats associated with this ditch are of limited extent and value, the ditch is connected to Cupid Row Canal and thus may provide some habitat value for the three sensitive species known to occur in the immediate vicinity. Consequently, disturbances of this ditch are considered significant.

Tributary Drainages West of CalTrain Tracks. There are five drainage ditches or channels within the construction easement west of the CalTrain tracks. Immediately east of San Felipe Avenue, there are two drainage ditches flowing from the east to the west and cross the construction easement. Approximately 20 feet of each of these ditches run through the construction easement,

supporting approximately 220 square feet or 0.005 acres of wetland habitats. A third drainage crosses the construction easement just east of San Marco Avenue. Approximately 15 feet of this drainage (which is the western-most end of the San Felipe Canal) crosses the construction easement, supporting approximately 50 square feet or 0.001 acres of wetland habitat. A fourth drainage ditch crosses the construction easement between San Mateo and San Diego Avenues. Approximately 340 feet of this drainage ditch is within the construction easement, supporting approximately 2,200 square feet or 0.05 acres of wetland habitat. The fifth drainage is located approximately 500 feet north of Center Street. Unlike the earthen drainages noted above, this drainage is concrete lined; however, it does flow directly into South Lomita Canal and is located in an area that is known to support the SFGS, California red-legged frog and San Francisco forktail damselfly. Approximately 110 feet of this drainage channel is within the construction easement, supporting approximately 900 square feet or 0.02 acres of wetland habitat. Construction activities in these areas would result in the temporary disturbance of these drainages and their associated wetlands.

Seasonal Wetlands. The construction easement along the mainline track alignment encompasses one entire seasonal wetland (approximately 0.43 acres) on the west side of the CalTrain tracks, and a portion of a second seasonal wetland (approximately 0.04 acres) located along the San Felipe Canal east of Santa Clara Avenue and the CalTrain tracks. Construction activities in these wetland areas would result in the temporary disturbance and degradation of these habitats.

Drainages East of the CalTrain Tracks. Approximately 15 feet of the small drainage ditch near San Diego Avenue crosses the construction easement on the east side of the CalTrain tracks and proposed BART tracks. Construction activities in this area could temporarily destroy or degrade approximately 60 square feet or 0.001 acres of wetland habitat. A small drainage channel that runs from Madrone Street to South Lomita Canal is contained within the permanent easement and would be relocated from this retained cut portion of the track alignment. It is assumed that the channel would be relocated to the east and maintained as an open channel. Consequently, the relocation and restoration of this 0.02-acre drainage feature would be part of the project design.

Construction Storage Yard and Staging Area. The construction of the BART mainline from Angus Avenue to Center Street and the aerial structure between the mainline and the SFIA property west of Highway 101 would be supported from one of three temporary storage yard and staging area alternative locations (see Figure 3.13-3). The Alternative A site, approximately 1.4 acres, is owned by the City of San Bruno and is currently used as a community garden. Construction access to this site would be via existing streets in San Bruno. This alternative storage yard and staging area would not directly disturb any additional wetland habitats or any other significant biological resources.

The Alternative B site is approximately 3 acres in size and located east of the Lion's Field Park on the west of Bayshore parcel under and adjacent to the PG&E transmission lines. Construction access to this yard and staging area would be via a new, temporary road connecting to the existing Caltrans collector-distributor road along the western side of Highway 101. The use of this alternative site would result in the temporary disturbance of approximately 0.80 acres of wetland habitats. Approximately 0.56 acres of the 0.80 acres is seasonal wetlands that occur within the storage yard staging area itself. The proposed temporary access road would include approximately 0.22 acres of seasonal wetlands and an additional 0.02 acres of permanent wetlands associated with

Cupid Row Canal. Although the access road would span Cupid Row Canal and thus not directly disturb the wetland habitats within this portion of the canal, the temporary bridge would shade the channel, and the noises and dust associated with the construction traffic would adversely affect the vegetation and habitat beneath the bridge and in the immediate vicinity over the two or three years the yard and staging area would be in use.

The Alternative C site is approximately 3 acres in size and located immediately east of the CalTrain tracks and south of Cupid Row Canal. Construction access to this yard and staging area would be via either a new, temporary road connecting to the existing Caltrans collector-distributor road along the western side of Highway 101 (as under the Alternative B site) or via existing streets in San Bruno (as under the Alternative A site). This alternative storage yard and staging area site would disturb between approximately 0.04 to 0.28 acres, depending upon the means of access chosen to this site. The disturbed wetlands would consist of two small isolated seasonal wetlands within the 3-acre storage area itself and the seasonal wetlands and permanent wetlands associated with the access road to Highway 101.

MITIGATION MEASURES. The following mitigation measures implemented together would reduce the identified impact to an insignificant level.

3.1 *Alterations to the Proposed Construction Easement and Selection of the Construction Storage Yard and Staging Area Alternative to Avoid or Reduce Wetland Disturbance.* The following alterations to the proposed construction right-of-way and project design would avoid the identified impacts.

- a. The construction easement in the area of Cupid Row Canal would eliminate the portion of Cupid Row Canal east of the existing bridge crossing Cupid Row Canal and west of the CalTrain tracks.
- b. The preferred construction storage yard and staging area is Alternative A, with access via existing streets. This mitigation measure would result in greater noise and traffic impacts on local city streets and displace the community garden.
- c. If the Alternative B construction storage yard and staging area were selected, it would be configured to avoid the seasonal wetlands as much as possible. A preferred configuration for the storage yard and staging area would be to avoid the areas north of the PG&E transmission towers and, if necessary, expand eastward into the upland habitats east of the proposed site. If possible, access to this site should also be via existing public streets, as proposed for Alternative A. To provide access to this site, a temporary road connecting to the existing Caltrans collector-distributor road along the western side of Highway 101 would be configured to minimize impacts to the adjacent wetlands. A suitable access road alignment designed to minimize impacts to the adjacent wetlands would be delineated in the field by a qualified biologist in consultation with the construction contractor and Caltrans.

3.2 *Minimizing Construction-Related Impacts in Seasonal Wetlands.* BART will employ two means of minimizing construction-related impacts to the seasonal wetlands that are to be restored. First, any heavy equipment that may be used in clearing woody vegetation within the seasonal wetlands along the mainline will be equipped with special low-pressure tires or tracks to minimize soil compaction. Whenever possible and practicable, woody vegetation will be cleared by hand rather than by heavy equipment. This type of low-impact clearing will be most appropriate for the blackberry bushes along the South Lomita Canal. Once the

woody vegetation was cleared in the yard and staging area, a mat of geotextile fabric would be placed over the wetlands to further minimize native soil compaction and potential contamination during construction activities. A temporary working surface of gravel would be placed over the geotextile fabric and graded. After the completion of construction and testing, the gravel and fabric would be removed and the entire site restored. This means of minimizing impacts would be employed in all areas within the construction storage yard and staging area.

- 3.3 *Restoration of Disturbed Wetlands Sites.* Wetland habitats within the construction right-of-way that could not be avoided through Mitigation Measure 3.1 will be restored to their original topographic contours with the same top soil removed from the area (if applicable), and then reseeded or revegetated with the same plant species found at the site prior to construction. This mitigation measure would be appropriate for the two drainage ditches that are to be relocated north of Cupid Row Canal and south of South Lomita Canal, the various drainage ditches located within the construction easement west of the CalTrain tracks, and all seasonal wetlands that would be disturbed on and adjacent to the west of Bayshore parcel.

Prior to construction, each wetland site potentially disturbed would be characterized by a wetland restoration biologist. The restoration biologist would collect information on the diversity and density of plant species at each site and provide a photographic record of the wetland prior to and during construction. In addition, the restoration biologist would monitor construction activities and develop a restoration plan for each impacted wetland. The restoration plans would identify criteria to evaluate the effectiveness of the restoration effort, identify specific techniques to be used, and provide a schedule for the restoration effort.

- 3.4 *Employment of a Construction Monitor.* Throughout the preconstruction and construction period, BART will employ a construction monitor to guide and assure that the mitigation measures are implemented successfully. This person would have review authority over all planned construction activities and mitigation measures, monitor all construction activities in the field with authority to stop work if necessary, and serve as the liaison between BART, the resource agencies, and the construction contractor.

- 3.5 *Implementation of Sensitive Construction Practices.* BART will require the construction contractor to employ sensitive construction techniques in the west of Bayshore parcel area, including daily clean-up of construction sites, fuels and liquid spill containment measures; rapid emergency response planning and implementation; and offsite refueling.

4. *Construction of the mainline portion of Alternative VI Aerial Option would disturb endangered species habitat and may result in the loss of individuals and/or SFGS habitats. (S)*

All proposed construction activities for the mainline on and in the immediate vicinity of the west of Bayshore parcel could have an effect upon the habitats of the endangered SFGS, the California red-legged frog, and/or the San Francisco forktail damselfly, and may result in the loss of individual SFGS and California red-legged frogs. It is not possible to accurately estimate the number of individual snakes and/or frogs that could be lost as a result of the proposed construction activities due to the lack of more recent information on the populations of these species at this site, and the

preliminary design of the project. Potential impacts to these sensitive species, in particular the SFGS, include the loss or disturbance of breeding or feeding habitats, the loss of cover (or hibernacula) habitats, increased potential for mortality due to predation, mortality of individuals already within construction sites or that wander onto construction sites, reductions in food sources, and/or indirect disturbances that interrupt the species behavior patterns or use of particular feeding, breeding or cover habitats. Due to the extremely precarious condition of the SFGS population on this site, any direct or indirect impact could result in the extirpation of the population (USFWS, 1995). While all of the construction sites are sensitive, certain areas are of particular concern regarding impacts to the SFGS. These areas include Cupid Row Canal and those areas in the immediate vicinity of this canal, and those portions of the mainline that run next to South Lomita Canal. Specific impacts associated with each of these two areas are discussed below.

Cupid Row Canal and Immediate Vicinity. The proposed BART mainline tracks would cross the western end of this canal, where storage yard and staging area Alternatives A and B are located. These activities would directly impact only a small area of Cupid Row Canal: a portion of the tracks crossing the canal may have to be lined with concrete; and placement of the temporary access road from the Alternative B storage yard and staging area where it crosses over the channel to connect with the collector/distributor road west of Highway 101. Although these areas of potential direct impact to the habitats of all three sensitive species is rather limited, all three of these construction areas are close enough to the canal that the noise and activities associated with these construction sites could possibly disrupt the breeding and/or feeding activities of the SFGS along Cupid Row Canal.

South Lomita Canal and Immediate Vicinity. Although the Aerial Design Option has been designed to avoid the wetland habitats associated with South Lomita Canal to the greatest extent possible, construction of the mainline tracks in this area would require the removal and loss of a limited amount of wetlands associated with the tributary channel near Madrone Street, and the loss of a portion of the cover habitat (or hibernacula) used by the SFGS in the blackberry thicket between the canal and the CalTrain tracks. The loss of these habitats poses a significant threat to the population.

MITIGATION MEASURES. Suitable mitigation measures for this impact will have to be approved by the USFWS under Sections 7 and 9 of the FESA and by the CDFG under the state ESA. The FTA intends to initiate formal consultation on the Alternative VI Aerial Design Option following the publication of the FRDEIR/S#2DEIS. It is anticipated that the USFWS and CDFG will issue an opinion prior to publication of the FEIR/FEIS. The following mitigation measure was developed in consultation with the USFWS and CDFG and has been designed to address the potential unavailability of SFIA property for BART project mitigation.

- 4.1 *Clearance of SFGS from all Construction Sites.* BART will clear all construction sites of SFGS in the manner defined by the USFWS and CDFG. Captured snakes will be removed from the site as part of a captive feeding program and kept in an approved facility, such as a university, zoo, or other research facility. An exclusion fence will be constructed to ensure snakes do not reenter construction areas. The exclusion fencing will be maintained until construction activities are completed for the temporary trestle bridge and sheet piling around the aerial structure footings are in place.

In wetland habitats, the fencing should be erected in the spring, between March and May, when snakes are most active. For most of the small affected wetlands, an intensive trapping effort for one or more months should remove all snakes from the site.

Clearance of the blackberry thicket between the South Lomita Canal and CalTrain tracks will be carefully planned and implemented. The exclusion fencing will be established prior to when the snakes come out of hibernation. When they emerge, the clearing of the blackberry bushes will be done by hand. No heavy mechanized equipment should be used in this area. Hand-held, motorized vegetation clearing equipment may be used. As the vegetation is cleared, the snakes will move offsite and be captured in the traps, to then be sent to the captive feeding program facility.

Aerial Wye-Stub to the SFIA (Options B and X)

5. *The initial geotechnical field investigations would temporarily disturb approximately 0.09 acres of habitat on the west of Bayshore parcel. (S)*

BART must conduct geotechnical field investigations identical to those described under Impact 1, above, for the two aerial guideways across the west of Bayshore parcel. The field investigation program has been designed to minimize the number of test locations to the greatest extent possible and to avoid wetlands in locating the test sites. In addition, as many exploratory borings as possible have been located in existing roadways to further minimize impacts to potentially sensitive upland habitats.

The initial eight soil boring locations planned for these field investigations in the immediate vicinity of the west of Bayshore parcel would temporarily disturb approximately a total of 2,400 square feet or 0.06 acres of upland habitat. Additional areas of impact would occur associated with off-road vehicle access to and from the specific test sites. Completion of each boring is not expected to take more than one day, or six to eight hours, and the entire field investigation in this area is not expected to take longer than ten days, barring adverse weather conditions.

The initial five cone penetrometer test sites would disturb approximately 1,200 square feet or 0.03 acres of upland habitat on the west of Bayshore parcel. As with the soil test borings, additional areas of impact to upland areas would occur associated with offroad vehicle access to and from specific test sites.

MITIGATION MEASURES. The mitigation measures for this impact are identical to those presented for Impact 1, above and would reduce this impact to a less than significant level.

6. *Relocation of the PG&E transmission lines would result in additional disturbances to the biotic resources on the west of Bayshore parcel. (S)*

The aerial tracks crossing over the west of Bayshore parcel would conflict with the existing PG&E 115 kV transmission lines. PG&E has proposed two options to address this impact.

Underground Option. The transmission lines between the two sets of towers that the BART aerial tracks would pass between would be relocated underground within the PG&E easement. PG&E is

evaluating three underground methods: directional drilling, jack and bore, and trenching. Directional drilling or jack and bore activities would limit disturbances to work areas around the new dead-end towers. These disturbance or work areas would be approximately 100 feet along the direction of the wires and 150 feet perpendicular to the wires. All directional drilling or jack and bore activities, modification of the existing towers, and erection of the new dead-end towers would be conducted within these work areas. These work areas would be situated to avoid any direct impacts to surrounding existing wetlands.

Trenching would require additional surface disturbance. The underground conduits containing the transmission lines are typically less than 12 inches in diameter. It is assumed for this analysis that each of the trenches would be no more than 2 feet in width. It is also assumed that a single trench would be needed for each circuit, or three trenches between the dead-end towers. Assuming the trenches would follow the existing aerial alignment, approximately 700 feet of the three trenches would run through the seasonal wetland between the existing transmission towers, resulting in the temporary disturbance of approximately 0.03 acres of wetland habitat.

These working areas would be accessed from the north at 1st Avenue by existing dirt roads and thus would not result in additional disturbances to the west of Bayshore parcel.

Overhead Option. If BART and PG&E select a multi-use structure consisting of transmission towers mounted on the aerial railway, power service through the site during construction of this transmission tower would have to be maintained on a temporary or shoofly transmission line installed around the periphery of the construction area. The existing transmission lines are a primary source of power to San Francisco, and power service provided by these lines cannot be interrupted for any extended period of time. Upon completion of the BART aerial structure through the west of Bayshore parcel, the shoofly line would be removed. The construction of this shoofly line would result in additional disturbances to the west of Bayshore parcel, including potential disruption of upland habitat area and disruption of existing wetlands.

MITIGATION MEASURES. The following mitigation measure would reduce the identified impacts to an insignificant level. This mitigation measure is designed to address either construction option: underground transmission lines or aerial transmission lines incorporated into the BART aerial structure. If at all feasible and possible, BART and PG&E will relocate the transmission lines below ground to avoid impacts to wetlands in the area.

6.1 *Minimization of Ground Disturbances Through Sensitive Construction Techniques and Monitoring Efforts.* Many of the same mitigation techniques identified for Impact 2 would apply to this impact as well, including the implementation of sensitive construction practices, such as the use of low-pressure tires or tracks in trenching; development and implementation of a wetland restoration plan; and the employment and use of a biology monitor.

Additional measures may be required by the USFWS as part of the Section 7 consultation and by CDFG as part of the Section 2081 consultation and will be incorporated into the construction program.

7. *Construction of the two aerial guideways of the Alternative VI Aerial Design Option over the west of Bayshore parcel would disturb approximately 0.06 to 0.98 acres of wetlands, depending upon the*

alternative construction storage yard and staging area selected and the type of temporary construction roadway used across the site. (S)

A construction right-of-way has been designed to allow for adequate workspace as well as to minimize disturbances in this highly sensitive area. It is assumed that movement of construction equipment would occur throughout the right-of-way, except where otherwise described; thus, construction activities would disturb approximately 0.06 to 0.98 acres of wetland and canal habitats that currently occur within the construction right-of-way. These wetland types vary from intermittent creeks and drainages to large drainage canals that carry water year-round. Impacts to these wetlands are described below:

Aerial Track. Construction of the aerial tracks of the wye-stubs over the west of Bayshore parcel would be from one of two optional temporary roadways. One option would be a 40-foot-wide temporary construction trestle bridge along one side of each wye-stub segment. Construction of the temporary construction trestle would require the placement of temporary pilings into the soils. The trestle would be prefabricated and placed on the temporary pilings. Dimensions of the temporary piles for this structure would be approximately 18 to 20 inches in diameter. Each bent of the bridge would require two piers at each end or a total of four piers. Each bent is assumed to be approximately 20 feet in length (the length will likely correspond to spacing of the stationary outriggers of the crane, such that the crane can support itself on the piers). The length of the temporary construction trestle needed to span the seasonal wetland west of Highway 101 is approximately 150 feet. This would require the placement of up to eight full bents over the wetland, or 32 piles placed into the wetland. This would result in the temporary disturbance of less than 0.001 acres of wetland habitat. A similar type of calculation for the portion of the temporary construction bridge over South Lomita Canal (approximately 300 feet in length) indicates that the placement of the bridge piers would temporarily disturb approximately 0.001 acres of wetland habitat in this canal.

The second temporary construction road option would be on a raised earthen berm approximately 40 feet wide, also located on one side of each wye-stub leg. The temporary earthen berm roadway would require the placement of earthen fill material in approximately 0.12 acres of the seasonal wetland just west of Highway 101.

Pilings and Footings for Aerial Tracks. Pilings for the construction trestle and footings for the aerial tracks would be the only points of disturbance on the surface of the ground along the aerial alignment on the west of Bayshore parcel. The proposed aerial alignment would cross only a large seasonal wetland next to Highway 101 and the point where San Felipe Canal runs into the South Lomita Canal. Construction of the aerial track footings would require excavating an area for the placement of the aerial structure foundation consisting of concrete caisson piles and a concrete cap. The area of excavation for each footing would have vertical walls with metal sheeting to shore up the walls. The use of metal sheeting would preclude the need to excavate the walls with slopes of 2:1 or 3:1 and thus limit the area of excavation to the greatest extent possible. All excavating equipment would operate from the temporary construction trestle, and all excavated materials would be removed from the site and stored or disposed at an approved construction storage yard and staging area. Two of the aerial structure footings would be located in one of the large seasonal wetlands west of Highway 101 and beneath the PG&E power lines. The excavation surface area within the metal sheet piles for each of these footings would be approximately 33 feet by 38 feet or

approximately 1,250 square feet (0.03 acres). This would result in the disturbance of approximately 2,600 square feet (0.06 acres) of habitat within this wetland. Although the aerial structure alignment would pass over the point where San Felipe Canal runs into the South Lomita Canal, the two footings in this area would be designed to avoid these waterways by placing the footings next to the aerial structure and out of the channels and extending a supporting arm from the footings to the aerial structure.

Construction Storage Yard and Staging Area. The impacts associated with this project construction feature would be identical to those identified in Impact 3, above.

MITIGATION MEASURES. The mitigation measures for these impacts are identical to those identified for Impact 3, above and would reduce this impact to a less than significant level.

8. *Construction of the aerial wye-stub portion of the Alternative VI Aerial Design Option would disturb endangered species habitat and may result in the loss of individuals and/or SFGS habitats. (S)*

Construction activities on the west of Bayshore parcel could have an effect upon the habitats of the endangered SFGS, the California red-legged frog, and/or the San Francisco forktail damselfly, and may result in the loss of individual SFGS and California red-legged frogs. Specific impacts associated with this area are discussed below.

Interruption of SFGS Movement Corridors. Construction of the temporary earthen berm roadway could represent a barrier to the movements of the SFGS on the west of Bayshore parcel. BART has attempted to address this potential impact by providing passage corridors (culverts) installed at ground level at 50-foot intervals spanning the width of the raised berm. The purpose of these culverts are to allow the passage of wildlife and water through the earthen berm.

Seasonal Wetlands and Upland Habitats Between Highway 101 and CalTrain. Although the construction of the aerial wye-structure has been designed to minimize impacts to the upland and wetland habitats in this area, there would be unavoidable impacts to the ground surface associated with not only the aerial structure but also with the PG&E relocation of transmission lines underground. The greatest threat to the SFGS as a result of these construction activities would be the potential disruption of the SFGS north and south travel corridors on the site, as noted above.

MITIGATION MEASURES. The mitigation measures for these impacts are identical to those identified for Impact 4, above, along with the following mitigation measure for the temporary earthen berm construction road. Implementation of this measure would reduce the impact to a less than significant level.

- 8.1 *Additional Design Features of the Culverts to Promote SFGS Passage.* The following design parameters were provided by Dr. Samuel M. McGinnis Ph.D., noted SFGS expert, on a proposed use of culverts on a roadway to preserve an SFGS travel corridor (McGinnis, 1988) and are suggested for this effort as well. The culverts should be 3 to 6 feet in diameter, filled to approximately one-third of their volume with soil, and landscaped with scattered rocks and wood branches to provide cover for snakes passing through the culvert. Snake drift fences should be attached at both ends of the culverts and extend along the entire base of both sides

of the berm. These drift fences would prevent SFGS from entering the construction area on the roadway and direct the snakes to the culverts. These fences should be checked and maintained throughout the construction period.

Hydrology and Water Quality

Runoff impacts under the Alternative VI Aerial Design Option (both Option B and X) would be slightly greater than those described for Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

1. *Construction activities for the Aerial Design Option would increase soil erosion and sediment deposition, but these effects would be insignificant. (I)*

Although driving and removing pilings would result in an increase in suspended soil in stormwater runoff compared to Alternative VI, use of the construction trestle would minimize runoff. Soil may be suspended in the water covering the wetland area during the rainy season. Since the water would be slow-moving, much of the soil would settle out before the water discharged into the San Francisco Bay; therefore, no significant impact would occur.

The earthen berm construction road option to the construction trestle would include culverts every 50 feet along its base to allow surface waters to flow through the site. The berm would be covered or vegetated to minimize soil erosion and sediment deposition into the surrounding wetlands.

Noise and Vibration

Impacts described under Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS also apply to the Alternative VI Aerial Design Option (both Option B and X), with three additions. Unlike Alternative VI Tunnel, there would be no construction impacts to homes on Santa Paula Avenue from tunnel mining operations.

Construction options for the PG&E transmission lines could result in impacts similar to those identified for the construction of Alternative VI Tunnel. These impacts would be reduced to an insignificant level through implementation of the mitigation measures identified for Alternative VI.

Mainline through San Bruno, Millbrae, and Burlingame

1. *Truck traffic to and from laydown yard Alternative A and possibly to and from Alternative C would result in significant, short-term noise impacts for residents along 1st Avenue. (S)*

The west end of Lion's Field Park would be affected by truck traffic within 25 feet of homes along 1st Avenue if laydown yard Alternative A were selected. This same impact would occur with Alternative C if the same access route is selected as proposed for Alternative A. A typical excavation day would involve approximately 160 truck trips (both directions combined). During construction, truck trips could reach 240 trips (both directions combined). These activities would be repeated on an approximate eight-week cycle, with a week or two between excavation and concrete pour. These noise impacts would occur for the duration of the excavation and construction phase of the project.

MITIGATION MEASURES. These significant noise impacts along the 1st Avenue haul route under yard Alternative A and possibly under Alternative C could be mitigated to an insignificant level by implementing the following mitigation.

- 1.1 *Temporary Road and Wall Construction.* Construction traffic will not be allowed to use 1st Avenue but will be accommodated on a temporary haul route to the west, between 1st Avenue and the CalTrain tracks. In addition, a temporary noise barrier will be erected on either side of the temporary haul route. The mitigation would involve using some of the current CalTrain right-of-way and temporary relocation of the San Bruno CalTrain Station.
2. *Truck traffic to and from yard Alternative B (between Lion's Field Park and Highway 101) would travel a temporary road connecting to an existing collector-distributor road along the westerly side of Highway 101 and would not result in significant noise impacts. (I)*
3. *Construction of the subway structure adjacent to the Bayside Manor, Millbrae Manor, Marino Vista, and North Millbrae neighborhoods would require the use of heavy equipment and machines that generate noise and could affect residences. (S)*

The Millbrae Avenue Station site would be used as a staging area; as a result, residences on Aviator Avenue could be affected by construction activities. There would also be noise impacts to residences on either side of the CalTrain right-of-way due to trucks. Residents adjacent to the right-of-way in the following neighborhoods would be exposed to significant noise levels: Bayside Manor, Millbrae Manor, North Millbrae, Marino Vista.

By contrast, the truck route for the Millbrae yard would run from Rollins Road to Millbrae Avenue to Highway 101. There are no known noise-sensitive receptors along Millbrae Avenue east of the CalTrain tracks. Consequently, there would be no significant noise impacts associated with this truck route.

MITIGATION MEASURES. Implementation of the following mitigation measure would reduce the noise impact to an insignificant level.

- 3.1 *Temporary Noise Barriers.* BART will construct temporary noise barriers, which may need to be greater than 12 feet in height, to reduce noise impacts to or below BART's project construction noise criteria. Implementation of this mitigation measure would result in a temporary, significant visual impact.
4. *If impact or vibratory pile driving is found to be necessary for construction of the Millbrae Avenue Station, significant noise and vibration impacts to the Serra Convalescent facility from unshielded pile drivers could occur. (This impact also applies to Alternative VI.) (S)*

MITIGATION MEASURES. Implementation of Mitigation Measures 4.1, 4.2, or 4.3 would reduce the noise impact to an insignificant level. If these measures were determined infeasible during final design, the impact of pile drivers would be significant and unavoidable. If Mitigation Measure 4.4 were implemented, noise impacts would be only partially mitigated.

- 4.1 *Pre-drilled Piles.* BART will implement pre-drilled pile drivers, if feasible. In some instances, holes can be pre-drilled, reducing the duration of noise exposure as well as the noise level.
- 4.2 *Cast-in-Drilled-Hole Piles.* BART will use cast-in-drilled-hole piles. These piles are constructed by drilling each pile to the desired depth and constructing the pile from cast-in-place reinforced concrete. This type of construction requires specific soil conditions which may not be present at this site.
- 4.3 *Special Hydraulic Pile Driver.* BART will implement the use of special hydraulic pile drivers, if feasible. Hydraulic pile drivers produce less noise than either impact or vibratory pile drivers, but can be used only where soil conditions permit.
- 4.4 *Shielded Pile Driver.* If the above mitigation measures are not feasible, BART will require the use of shielded pile drivers, which produce less noise than unshielded pile drivers. A physical shield would be placed around the driver to reduce the noise impacts. This measure, however, would not reduce vibration impacts.

Aerial Wye-Stub to SFIA (Options B and X)

5. *If impact or vibratory pile driving is found to be necessary for construction of the aerial wye-stub to the SFIA, significant noise and vibration impacts from unshielded pile drivers could occur to wildlife and sensitive receptors along San Antonio Avenue. (S)*

MITIGATION MEASURES. Implementation of Mitigation Measures 4.1, 4.2, or 4.3 would reduce noise and vibration impacts to an insignificant level. If these measures were determined infeasible during final design, this impact would be significant and unavoidable. If Mitigation Measure 4.4 were implemented, noise impacts would be only partially mitigated.

Air Quality

Construction-related emissions under the Alternative VI Aerial Design Option would be the same order of magnitude as those described under Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS.

1. *Construction-related activities would generate air emissions that exceed Bay Area Air Quality Management District significance criteria. (S)*

Table 3.13-4 presents estimated emissions of air pollutants associated with construction of the Aerial Design Option. Emissions-related impacts under the Aerial Design Option would be the same as those under Alternative VI. Construction-related emissions under the Aerial Design Option exceed BAAQMD significance thresholds: 1) emissions of ozone precursors (NO_x and ROG) exceed the emission offset/BACT thresholds of 10 lb/day and 15 ton/yr; 2) emissions of PM_{10} exceed the emission offset/BACT thresholds of 10 lb/day and 1 ton/yr; and 3) emissions of NO_2 exceed the net increase threshold of 150 lb/day.

MITIGATION MEASURES. Implementation of the mitigation measures recommended under Alternative VI would reduce equipment exhaust emissions and fugitive dust emissions associated

with the construction of the Aerial Design Option. These mitigation measures include optimal configuration of construction parking, provision of temporary traffic control, scheduling of construction activities during off-peak hours, construction traffic management, equipment engine maintenance, and best construction practices. Implementation of these mitigation measures, however, would not reduce emissions to levels below the significance thresholds. Therefore, construction emissions of CO, ROG, NO_x, and PM₁₀ would exceed significance criteria. These exceedences would also occur under Alternative VI.

Table 3.13-4
Estimated Total Construction Emissions

	Equipment Exhaust					Fugitive	Total
	CO	ROG	NO _x	SO _x	PM ₁₀	PM ₁₀	PM ₁₀
Emissions (lb/day)	410	99	1,000	87	76	2000	2,000
Emissions (ton/yr)	74	18	180	16	14	300	300

Notes:

- 1) Emission estimates based on equipment usage, horsepower ratings, load factors, and pollutant emission factors.
- 2) Equipment usage data associated with construction north of Sylvan Avenue from the Construction Scenario Report (BATC, 1994). Equipment usage data associated with construction of project south of Sylvan Avenue from *Construction Scenario Report for Alternative VI Aerial Wye-Stub Design Option* (BATC, 1995).
- 3) Equipment horsepower ratings, load factors, and pollutant emission factors from *CEQA Air Quality Handbook* (SCAQMD, 1993) and from *Compilation of Air Pollutant Emission Factors AP-42 Volume II: Mobile Sources* (EPA, 1985).

Public Health and Safety

Impacts associated with the Alternative VI Aerial Design Option would be largely the same as those described under Alternative VI in Chapter 3, Section 13.2, of the DEIR/SDEIS. Since less excavation would occur during construction of the aerial wye-stub than during construction of the tunnel, potential exposure to contaminated soils and/or groundwater during construction would be reduced.

Energy

Construction of the guideways and stations for the Alternative VI Aerial Design Option is estimated to require a maximum of 981.15 billion Btu per year, which is slightly greater than for Alternative VI.

Cumulative Analysis

SFIA expansion projects would cumulate with the BART extension project. The cumulative analysis for the Alternative VI Aerial Design Option is the same as that presented for Alternative VI, Chapter 3, Section 13.2, in the DEIR/SDEIS, with the differences noted below.

If the SFIA constructs new freeway ramps connecting Highway 101 with the Airport GTC/RCG concurrently with BART construction, freeway operations may be impacted. To minimize the duration of disruptions, construction of the BART aerial structure should be coordinated with the SFIA projects and construction hours should be limited to off-peak hours.

Significant cumulative short-term effects on biological resources may occur if BART construction activities in the west of Bayshore parcel were coupled with long-term development plans by SFIA for this same area. The cumulative effects would include the loss and/or degradation of wetlands as well as foraging and breeding habitats for the SFGS, California red-legged frog, and San Francisco forktail damselfly.

Chapter 4

Other CEQA/NEPA Topics

4.1 INTRODUCTION

This chapter provides a summary of impacts that cannot be mitigated to an insignificant level, a discussion of irreversible and irretrievable commitment of resources, cumulative and growth-inducing impacts, areas of controversy, and issues that must be resolved prior to project approval.

4.2 UNAVOIDABLE ADVERSE IMPACTS

The impact analysis in Chapter 3 of this document identifies significant impacts and the mitigation measures required to reduce those impacts to an insignificant level. Significant impacts of the Alternative VI Aerial Design Option that differ from those identified for Alternative VI Tunnel and that cannot be mitigated to an insignificant level are identified below.

Long-Term Effects

- The elevated guideways of the wye-stub north and south legs would alter the visual setting and detract from the SFIA property west of Bayshore as a scenic open space resource. The guideways would appear out of context with the undeveloped, natural setting and would obstruct views of this area and San Bruno Mountain from residences along Madrone Street in the Marino Vista neighborhood in Millbrae.

Short-Term Effects

Visual Quality

- Construction of the sound wall along the at-grade portion of the BART mainline would adversely affect close-up views and create a sense of encroachment and loss of privacy for residents along Huntington and San Antonio Avenues in San Bruno and along Landing Lane in Millbrae.
- The SFIA property west of Highway 101 would be temporarily altered by construction activities for the aerial alignment and mainline tracks; these activities would detract from views of this area and of San Bruno Mountain from both San Bruno and Millbrae neighborhoods.

Energy

- A maximum of 851.2 billion Btu per year of nonrenewable energy would be required.

Benefits Compared to Alternative VI Tunnel

The Aerial Design Option would result in fewer environmental impacts in some areas, compared to Alternative VI. The Aerial Design Option would eliminate the unavoidable groundborne noise impact to homes on Santa Paula Avenue in the North Millbrae neighborhood and vibration impacts to residences on Huntington Avenue in the Lomita Park neighborhood. Unmitigable vibration impacts would not occur at the SFIA under this design option because the alignment would be in an aerial, not subway, configuration. Unavoidable noise and vibration impacts would not occur along Hemlock Avenue in the Millbrae Manor neighborhood nor along Aviador Avenue in the Bayside Manor neighborhood except at the new crossover locations under the Alternative VI Aerial Design Option.

4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Alternative VI Aerial Design Option would require an irretrievable commitment of energy resources. Construction and operation would result in the direct consumption of petroleum fuels and electricity. The entire Alternative VI Aerial Design Option would require 255.57 million Btu of energy per day to operate. Cumulative energy consumption would be less under the Aerial Design Option than under Alternative VI.

The commitment of land and water resources and construction materials would be largely the same as described for Alternative VI.

4.4 SUMMARY OF CUMULATIVE IMPACTS

Cumulative effects are those resulting from future growth (projected by ABAG in *Projections '94*) in combination with the Alternative VI Aerial Design Option and other related projects. Other past, present, and reasonably foreseeable future projects include the development envisioned by the *San Francisco International Airport Final Draft Master Plan*. Cumulative effects for the Aerial Design Option are presented in Chapter 3 of this document, and would be the same as those described in Chapter 4, Section 4.4, of the DEIR/SDEIS, with one difference: the undeveloped, natural appearance and views of the SFIA property west of Highway 101 would be altered by the aerial guideways for BART in combination with the new highway ramps into and out of the airport.

4.5 GROWTH-INDUCING IMPACTS

The analysis of growth-inducing impacts presented in Chapter 4, Section 4.5, of the DEIR/SDEIS applies to the Alternative VI Aerial Design Option.

4.6 AREAS OF CONTROVERSY

The following is a summary of controversial issues that have been identified at BART, SamTrans, and San Francisco Airports Commission meetings for the Alternative VI Aerial Design Option.

- **CalTrain Connectivity.** Impacts to the approximately 10 percent of rail patrons to SFIA who will need to transfer to BART at the Millbrae Avenue Station and to the ALRS on airport property.
- **Biological Issues.** Need for mitigation on the SFIA property west of Highway 101 to reduce impacts to the habitat of the SFGS from construction of the BART facilities.

4.7 ISSUES TO BE RESOLVED

The following critical decisions must be made prior to the implementation of the BART–San Francisco Airport Extension :

- **Selection of a Project Alignment.** The BART and SamTrans Boards could reaffirm the Locally Preferred Alternative (i.e., Alternative VI selected in April 1995 by the BART and SamTrans Boards) or modify Alternative VI, incorporating Option B or X or design features of each.
- **Determination of Federal and SFIA Funding Contributions.** The estimated capital costs for the Alternative VI Aerial Design (Options B or X) are less than Alternative VI. BART, SamTrans, and MTC are working closely with the FTA and SFIA to determine appropriate funding for the LPA selected.
- **Selection and Adoption of Appropriate Mitigation Measures.** Mitigation measures have been developed to reduce and/or eliminate significant impacts in all areas of the environmental analysis. The BART and SamTrans Boards will identify the specific measures that will be incorporated into the project alternative selected for implementation.

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
JANUARY 1964

TO THE HONORABLE CHIEF OF BUREAU OF CHEMISTRY
WASHINGTON, D. C.

SUBJECT: [Illegible]

REFERENCE: [Illegible]

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Chapter 5

Section 4(f) Evaluation

5.1 INTRODUCTION

This section assesses the impacts of the Alternative VI Aerial Design Option on parks and historic resources that qualify for protection under Section 4(f) of the Department of Transportation Act of 1966.

5.2 DESCRIPTION OF PARKLANDS AND POTENTIAL EFFECTS

Parklands in the Project Corridor

A description of existing parks that may qualify for protection under Section 4(f) can be found in Chapter 5, Section 2, of the *BART–San Francisco Airport Extension Summary of the DEIR/Supplemental Draft Environmental Impact Statement (DEIR/SDEIS)*. The only park within the study area defined for the Aerial Design Option and in the vicinity of BART facilities proposed by this option is Lion's Field Park in San Bruno.

Parklands with Direct Impacts or Constructive Use

During construction of the Aerial Design Option alignment, one of three proposed contractor laydown areas would occupy sites adjacent to or nearby Lion's Field Park. Neither of the laydown areas would require use of parkland, so that there would be no direct impacts. The first, Alternative A, is approximately 1.4 acres at the community gardens immediately south of the park. The Alternative B laydown area, approximately 3.0 acres, is located east of Lion's Field Park in the open area under and adjacent to the existing PG&E transmission lines. The Alternative C laydown area is approximately 3.0 acres and lies south of the Alternative B laydown area just south of Cupid Row Canal and east of the CalTrain tracks. Use of any of these sites could increase noise and possibly dust levels in the park due to truck traffic. Neither of these effects would detract from the use and enjoyment of the park for baseball games as currently scheduled in the afternoons and evenings. However, in the mornings, the park is heavily used by small children and care providers. It is reported that adults enjoy passive activities such as socializing and sitting on the park benches. The proximity of the Alternative A laydown area may constitute a noise and visual intrusion that would interfere with use of the park. This is particularly true since the anticipated construction duration would be 45 months. As a result, Lion's Field Park may experience a "constructive" use.

There are trade offs with each laydown area alternative. Both Alternatives B and C have proposed haul routes that would connect via a temporary road to the Highway 101 frontage road. This connection would require CalTrans approval. The Alternative C site could be alternatively accessed via 1st Avenue the same as Alternative A. Additionally, both Alternatives B and C would disturb between .70 and 1.5 acres of wetlands.

Whereas Alternative A may result in a constructive use of Lion's Field Park, Alternatives B and C would avoid this constructive use but would impact wetlands and require negotiations with CalTrans.

Planning and Mitigation Measures. To avoid constructive use of the park associated with the Alternative A laydown area, BART could select the Alternative B site. If Alternative A is selected, BART will erect a temporary sound wall around the construction laydown area as mitigation to reduce noise from truck traffic and to screen views of equipment and materials from park users. To control dust, BART will require contractors to water the laydown site daily as necessary. These measures would minimize the adverse effects of the laydown area so that constructive use of Lion's Field Park would not occur.

Coordination. On July 17, 1995, the City of San Bruno Department of Parks and Recreation was consulted regarding impacts to Lion's Field Park. Director O'Shea agreed with the presentation of potential impacts, alternatives, and mitigation measures in this FRDEIR/S#2DEIS for Lion's Field Park.

5.3 DESCRIPTION OF HISTORIC SITES AND POTENTIAL EFFECTS

Historic Sites in the Project Corridor

The historic properties and districts subject to Section 4(f) are described in Chapter 5, Section 3, of the DEIR/SDEIS. The Aerial Design Option would affect the same properties and districts as described for Alternative VI in that section of the DEIR/SDEIS.

Chapter 6

Financial Analysis

6.1 FINANCIAL FEASIBILITY

This section presents the financial analysis component of the FRDEIR/S#2DEIS, providing the public and decision makers with estimated capital, and operations and maintenance costs associated with the Alternative VI Aerial Design Option. The proposed financing structure is also described.

Estimated Capital Costs

The capital cost estimates were prepared at a conceptual level of engineering, using 1996 dollars and estimated at midpoint of construction (see Table 6-1). The cost estimating methodology is the same as that described in Chapter 6 of the DEIR/SDEIS. Estimates will be refined as final preliminary engineering is completed, and environmental impact mitigation measures are defined more fully with the responsible agencies.

BART capital costs total \$1,074.3 million for Option B and \$1,056.2 million for Option X.

Estimated Operations and Maintenance Costs

Financial feasibility was examined using BART system operating assumptions that include all extensions (Colma, Dublin, and West Pittsburg) in operation. (See Chapter 2 of the DEIR/SDEIS for level of service assumptions.)

Systemwide BART costs are estimated at approximately \$273.8 million per year in 2010 (1996 dollars) under the TSM assumptions. Estimated annual systemwide Operations and Maintenance (O&M) costs are \$309.1 million for Alternative VI, \$308.3 million for Option B, and \$308.2 million for Option X (see Table 6-2). O&M costs for the BART extension alone (without the costs associated with the TSM assumptions) are estimated at \$35.3 million for Alternative VI, \$34.5 million for Option B, and at \$34.4 million for Option X.

Evaluation of Funding Sources Identified in the BART-San Francisco Airport Extension Financial Plans

Tables 6-3, 6-4, and 6-5 document the levels and the proposed structure of the capital funding needed for Alternative VI and Options B and X. There are seven funding sources for the alternatives: the federal government, State TCI funds, SamTrans, Proposition 116 funds, westbay bridge toll funds, SFIA funds, and other local funds. Table 6-3 outlines the amount of funds committed to the extension project, and the

Table 6-1
Estimated Capital Costs of BART–San Francisco Airport Extension
Alternative VI and Design Options
Conceptual Cost Estimate, 60-Month Schedule
Millions of 1996 Dollars at Mid-Point of Construction

	Alternative VI	Option B ⁽¹⁾	Option X ⁽²⁾
BART COSTS			
Right-of-Way	\$113.3	\$123.7	\$123.3
Line Costs	377.1	262.2	255.8
Stations	222.0	189.5	188.5
Systems	90.4	92.0	91.0
Vehicles			
BART Vehicles	104.6	104.6	104.6
SamTrans Vehicles	1.6	1.6	1.6
Engineering Services	225.2	186.9	181.0
Mitigation of Environmental Impacts	9.8	9.8	9.8
Contingencies & Reserves	93.8	77.8	75.4
Insurance	31.4	26.1	25.2
ESTIMATED PROJECT TOTAL ^(b)	\$1,269.2	\$1,074.3	\$1,056.2

Source: BART West Bay Extensions, 1995

Notes: "60-month schedule" begins with project approval and continues to beginning of pre-revenue service. Actual construction begins with letting construction contracts and continues to beginning of pre-revenue service.

- (1) Does not include the costs for: additional escalation, cost of financing the Federal funding share, cost reimbursement to United Airlines for the structural columns, and the cost of impacts on the SFIA Master Plan Projects and/or trace preservation.
- (2) Does not include the costs for: additional escalation, cost of financing the Federal funding share, and the cost of impacts on the SFIA Master Plan Projects and/or trace preservation.

Table 6-2
Estimated Operating and Maintenance Costs in 2010
Millions of 1996 Dollars

	Alternative VI	Option B	Option X
Annual Costs	\$309.1	\$308.3	\$308.2
Difference from TSM	\$35.3	\$34.5	\$34.4

Source: BART West Bay Extensions, 1995

Notes: SamTrans operations costs are similar for all build alternatives.

Table 6-3
Authorized, Committed and Uncommitted Funds Required
Millions of Dollars at Midpoint of Construction

	Alternative VI	Option B	Option X
Section 3 New Starts Funds Authorized (1)	\$301.0	\$301.0	\$301.0
State TCI Funds	\$98.0	\$98.0	\$98.0
SamTrans Sales Tax Funds	\$99.0	\$99.0	\$99.0
Proposition 116 Funds	\$10.0	\$10.0	\$10.0
Westbay Bridge Funds	\$10.0	\$10.0	\$10.0
SFIA Funds	<u>\$200.0</u>	<u>\$171.5</u>	<u>\$167.8</u>
Subtotal Committed Funds	\$718.0	\$689.5	\$685.8
Required Uncommitted funds (2)	<u>\$551.2</u>	<u>\$384.8</u>	<u>\$370.4</u>
Total	\$1269.2	\$1074.3	\$1056.2

Source: BART West Bay Extensions, 1995.

- 1) Section 3 New Starts funds authorized through ISTEA of 1991 and allocated in BART/SamTrans/Santa Clara County/MTC MOU December 1993.
- 2) Anticipated to come from federal, SFIA, and other local sources.

Table 6-4
Estimated Capital Funding and Proposed Funding Structure (1)
Alternative V1 (Tunnel) and Design Options
Millions of Dollars at Midpoint of Construction

	Alternative V1	Option B	Option X
Section 3 New Starts Funds Authorized (2)	301.0	301.0	301.0
Additional New Starts Funds Required (3)	<u>289.7</u>	<u>289.7</u>	<u>289.7</u>
Total New Starts Funds Required	590.7	590.7	590.7
Additional Federal Funds Required (4)	<u>209.3</u>	<u>95.1</u>	<u>80.7</u>
Total Federal Funds (5)	800.0	685.8	671.4
State TCI Funds	98.0	98.0	98.0
SamTrans Sales Tax Funds	99.0	99.0	99.0
Proposition 116 Funds	10.0	10.0	10.0
Westbay Bridge Toll Funds	10.0	10.0	10.0
SFIA Funds (6)	200.0	171.5	167.8
Unfunded Local Share (7)	52.2	0.0	0.0
Total	1,269.2	1,074.3	1,056.2

Source: BART West Bay Extensions, 1995.

- 1) Excludes any necessary financing costs eligible for federal funding.
- 2) Section 3 New Starts funds authorized through ISTEA Act of 1991 and allocated in BART/SamTrans/Santa Clara County/MTC MOU December 1993.
- 3) Additional federal funds required to reach \$590.7 million, the 1991 federal commitment to cover 75% of the cost of Alternative 3A (Least Cost Option) in Alternatives Analysis.
- 4) \$800 million, or remainder of total project costs with other elements fixed.
- 5) Amount equal to \$800 million, or remainder of total project costs with other elements fixed.
- 6) Subject to airport funding eligibility.
- 7) Amount remaining between sum of federal funds, State TCI and SamTrans funds, and total project cost. Costs of Alternative Analysis (\$2 million) covered by Section 9 grant and Sam Trans funds.

Table 6-5
Capital Funding Assumptions

	Alternative VI	Option B	Option X
Section 3 New Starts Funds Authorized	23.7%	28%	28.5%
Additional New Starts Funds Required	<u>22.8%</u>	<u>27%</u>	<u>27.4%</u>
Total New Starts Funds Required	46.5%	55%	55.9%
Additional Federal Funds Required	<u>16.5%</u>	<u>8.9%</u>	<u>7.6%</u>
Total Federal Funds	63%	63.8%	63.6%
State TCI Funds	7.7%	9.1%	9.3%
SamTrans Sales Tax Funds	7.8%	9.2%	9.4%
Proposition 116 Funds	0.8%	0.9%	0.9%
Westbay Bridge Toll Funds	0.8%	0.9%	0.9%
SFIA Funds	15.8%	16%	15.9%
Unfunded Local Share	<u>4.1%</u>	<u>0%</u>	<u>0%</u>
Total	100%	100%	100%

Source: BART West Bay Extensions, 1995.

required funds not yet committed. A complete financial plan is being developed by BART, MTC, SamTrans, and the SFIA, and will be available when a project is selected.

As directed by MTC and recommended by the U.S. Congress, BART and SamTrans developed the Aerial Design Option in order to reduce project costs from the \$1,269 million projected for Alternative VI. Option B is estimated to cost \$1,074 million, thus reducing project costs by \$195 million. Option X is estimated to cost \$1,056 million, reflecting a reduction of \$213 million.

The savings in project costs has first been allocated to cover the unfunded local share, shown as \$52.2 million under Alternative VI. Additional savings have been allocated to the FTA and SFIA in proportion to their relative contributions to Alternative VI funding. The \$800 million contribution of the FTA and the \$200 million contribution of SFIA result in 80 percent of net project cost savings being assigned to the FTA; the remaining 20 percent assigned to SFIA. Therefore, Option B shows federal participation at \$685.8 million and airport participation at \$171.5 million. Option X reduces federal participation further, to \$671.4 million and SFIA participation to \$167.8 million.

Federal Funds. The BART–San Francisco Airport Extension is authorized under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) to share \$568.5 million in Section 3 New Starts appropriations with BART's Colma Extension and Santa Clara County Transit District's Tasman Corridor light rail project. This amount covers the period from Federal Fiscal Year (FFY) 1990 through FFY 1997. BART, Santa Clara, MTC, and SamTrans approved a Memorandum of Understanding (MOU) dated December 17, 1993 that apportions the \$568.5 million as follows: \$124 million to the Colma project, \$301 million to the BART–San Francisco Airport Extension, and \$124.5 million to the Tasman project.

The MOU states that 75 percent of the cost of Alternative 3A in the 1992 AA/DEIS/DEIR, or \$590.7 million, could be fully funded by FFY 2001 with an annual level of New Starts appropriations to the San Francisco Bay Area (\$100 million per year). To reach the \$590.7 million funding level, the amount needed for the BART–San Francisco Airport Extension beyond that authorized in ISTEA is \$289.7 million.

It has clearly been anticipated that the proposed extension would require federal assistance beyond the current authorization, and that revisions to the amounts described in the MOU would be made as more information became available. The MOU states that, "In accordance with Section 3032 g(2), and Section 3(a)(4)(e) of the Federal Transit Act, both projects (Tasman corridor and BART–San Francisco Airport Extension) are entitled to Full Funding Grant Agreements that go beyond the current authorization if necessary, and to use the surplus in the Mass Transit Account of the Highway Trust Fund to support the multi-year funding commitment that fully funds both projects." In a letter to BART dated August 1995, Gordon Linton, FTA Administrator wrote, "Since the new start authorization currently provided for San Francisco BART/Tasman is \$568 million, this project has proceeded with the recognition that if FTA were to enter into an FFGA, it would have to use its 'contingent commitment' authority to do so, and that appropriations for the construction of the project would occur primarily in the context of the next authorization period." The funding program shown here assumes a federal contribution of \$685.8 million for Option B, and \$671.4 million for Option X.

Table 6-4 shows that the Aerial Design Option would need between \$80.7 million and \$95.1 million beyond the \$590.7 million discussed in the MOU. It is possible that the additional funding requirements would extend the amount of time it will take to fully fund the BART and Tasman projects.

SFIA Funds. SFIA has committed to cover \$200 million of the estimated \$356 million in on-airport costs of Alternative VI. This commitment is reinforced in correspondence from San Francisco Mayor Frank Jordan and the San Francisco Airports Commission and between Louis Turpen, former Director of Airports, and the FAA.

As outlined above, Option B would require \$171.5 million from SFIA, and Option X would require \$167.8 million. BART, SamTrans, SFIA, and MTC are currently working to determine the appropriate level of airport support for construction of the Aerial Design Option. Airport management is also working to define which funding sources (entitlement funds, grant funds, airport-generated capital funds, etc.) can be applied to various project costs (alignment, guideway, station, interface with airport construction elements, etc.). It is anticipated that all BART-SFIA funding negotiations will be completed by the end of 1995.

State TCI Funds. In its 1992 State Transportation Improvement Program, the California Transportation Commission (CTC) made an overall commitment to BART's Phase I Extensions program of \$536 million. BART has to date received over \$330 million towards this total, principally for the Colma, Dublin/Pleasanton, and Pittsburg/Antioch Extensions. A subset of this \$536 million commitment from CTC-allocated funding sources is a commitment of \$277 million in Transit Capital Improvement (TCI) funds, which was made in October 1988. The MTC Resolution No. 1876 programmed \$98 million of these TCI funds for the BART-San Francisco Airport Extension.

The CTC has already allocated \$14.6 million FY 94 TCI revenues to the BART-San Francisco Airport Extension. Further, the CTC has recommended that the project receive \$5 million in FY 96 TCI funds. The award of this \$19.6 million in TCI funds to the project would leave \$78.4 million of the total \$98 million commitment unfunded. The BART Extensions program has received between \$10 million and \$30 million annually in TCI funds over the last five years. Given that the extension to the airport is one of the CTC's highest priority projects, as well as BART's only extension project currently competing for annual TCI funds, this \$78.4 million balance could be allocated over the next four to six years.

The MTC Resolution No. 1876 Rail Extensions funding plan currently assumes that the CTC will contribute \$98.3 million in TCI funds to the extension, based on a 12.5 percent share of the \$788 million cost (escalated) of Alternative 3A of the AA/DEIS/DEIR. This \$98.3 million is maintained in the funding plan seen in Table 6-4, based on the ability of SamTrans to provide dollar-for-dollar matching funds.

SamTrans Funds. In March 1990 BART and SamTrans executed a "Cooperative Agreement Pertaining to BART System Extension." In this Agreement, SamTrans committed to pay for 25 percent of all FTA-eligible expenses on BART's Colma and San Francisco Airport extensions. The \$99 million contribution by SamTrans assumed in the 1990 Locally Preferred Alternative Report was calculated based on the Base Case Alternative of the AA/DEIS/DEIR. SamTrans continues to be committed to contributing \$99 million to the BART-San Francisco Airport Extension capital costs. In selecting Alternative VI as the new LPA in July 1995, the SamTrans Board of Directors reviewed an analysis of the District's ability to finance its share of the project. The analysis confirmed that SamTrans has the means to fund the \$99 million portion, and that this amount is available from existing reserves.

Proposition 116 Funds. Proposition 116 was approved by the voters of the State of California in June 1990. This measure called for the sale of nearly \$2 billion in general obligation bonds to fund transit improvement projects across the state according to a very detailed expenditure plan. This expenditure plan includes a \$10 million apportionment to SamTrans for expenditure on extensions of the BART system within San Mateo County. These funds were not programmed for the construction of the Colma Extension, and are therefore available to be allocated by the CTC to the BART–San Francisco Airport Extension.

Westbay Bridge Toll Funds. Approximately \$7 million of the tolls collected annually from automobiles crossing the San Francisco–Oakland Bay Bridge is reserved for transit capital improvements in the west bay counties of San Francisco, San Mateo, and Santa Clara. These funds are allocated by the MTC according to a policy statement adopted in April 1989 that lists projects in MTC Resolution No. 1876 New Rail Transit Starts and Extensions Program as the first priority for such funds. Since the BART–San Francisco Airport Extension is a major component of this program, MTC has already allocated \$1 million in Westbay Bridge Toll funds to the project. The financial plan documented in Tables 6-4 and 6-5 shows these allocations increasing to \$10 million for the project.

6.2 ANALYSIS OF COST EFFECTIVENESS

This section compiles and summarizes specific information needed to evaluate transportation effectiveness and equity characteristics of the various alternatives and design options (see Table 6-6). The discussion assesses each alternative in terms of transportation effectiveness, FTA's cost effectiveness criteria, station site characteristics, and equity.

Transportation System Effectiveness

This review of transportation system effectiveness focuses on the performance of the alternatives in providing transportation benefits estimated for the year 2010 as detailed in previous chapters.

Daily BART Entrances and Exits by Station. The Aerial Design Option is estimated to increase BART peninsula ridership in San Mateo County (Daly City to end-of-line station) above the 44,800 riders under the TSM assumptions by 49,600 for Option B and by 49,300 for Option X.

Daily Boardings. Daily boardings on the entire BART system are estimated to increase by 39,700 with Option B and 39,600 with Option X.

Travel Time Comparison. Travel times are estimated for a BART patron going from downtown San Francisco (the intersection of Montgomery and Market Streets) to the SFIA terminals. "Travel time" includes time spent arriving at the station, waiting for the train, traveling to the airport, and walking or riding the ALRS to the various terminals. Travel time is estimated at 44 minutes for either option.

Regional Transit Person Trips and Mode Split. Option B would increase daily regional transit trips by 23,300 in the year 2010. Option X would increase daily transit trips by 23,200 in 2010.

Air Passengers on Public Transit. Approximately 7,300 air passengers would use Option B daily to reach the SFIA and 7,200 would use Option X daily.

**Table 6-6
Transportation Effectiveness
Year 2010**

Measure	Alternative I No Build	Alternative VI Millbrae via SFO International Terminal	Option B	Option X
BART Daily Entrances/ Exits by Station (1)				
Daly City	13,600	13,300	13,300	13,300
Colma	<u>35,200</u>	<u>16,200</u>	<u>16,200</u>	<u>16,200</u>
Subtotal	48,800	29,500	29,500	29,500
Hickey	-	8,000	8,000	8,000
Tanforan	-	9,800	9,800	9,800
International Terminal	-	18,700	18,000	17,800
Millbrae Avenue	-	<u>33,400</u>	<u>33,100</u>	<u>33,000</u>
Subtotal	-	69,900	68,900	68,600
TOTAL	48,800	99,400	98,400	98,100
Daily Boardings (2)				
BART	359,400	402,400	401,500	401,400
Change from TSM	(2,400)	40,600	39,700	39,600
CalTrain	37,800	46,900	46,700	46,700
SamTrans	88,200	85,800	85,100	85,100
ALRS	0	6,400	6,200	6,200
Travel Time from Montgomery and Market Street to SFO Terminals (Minutes) (3)				
BART	44.00	42.00	44.00	44.00
Daily Regional Transit Trips (Linked Trips) (4)				
Work Trips	593,200	604,100	604,100	604,100
Non-Work Trips	<u>678,700</u>	<u>691,200</u>	<u>691,100</u>	<u>691,000</u>
Total	1,271,900	1,295,300	1,295,200	1,295,100
Change From TSM	(9,600)	13,800	23,300	23,200
Air Passengers on Public Transit (5)				
BART	-	7,600	7,300	7,200
CalTrain	200	3,300	3,200	3,200
Bus	<u>17,700</u>	<u>14,400</u>	<u>14,700</u>	<u>14,800</u>
Total	17,900	25,300	25,200	25,200

Table 6-6 (continued)
Transportation Effectiveness
Year 2010

Measure	Alternative I No Build	Alternative VI Millbrae via SFO International Terminal	Option B	Option X
Transit Utilization and Mode Share Percent by Trip Destination				
To SFIA (6)				
Transit Trips	23,300	33,600	33,500	33,400
Mode Share Percent	9.8%	16.5%	14.5%	14.1%
To Downtown SF from the Peninsula (7)				
Transit Trips	45,600	53,300	53,300	53,300
Mode Share Percent	34.9%	40.7%	40.7%	40.7%
LEVEL OF SERVICE (LOS)(8)				
Number of Intersections at:				
LOS D	6	8	8	8
LOS E	8	8	8	8
LOS F	0	0	0	0

Source: BART Extension Planning, 1994.

- 1) For more information, see Table 3.1-8 of this document, and Table 3.1-7 of the DEIR/SDEIS.
- 2) For more information, see Table 3.1-7 of this document, and Table 3.1-2 of the DEIR/SDEIS.
- 3) For more information, see Table 3.1-1 of this document, and Tables 3.1-19 and 3.1-65 of the DEIR/SDEIS.
- 4) For more information, see Table 3.1-5 of this document, and Table 3.1-3 of the DEIR/SDEIS.
- 5) For more information, see Table 3.1-6 of this document, and Tables 3.1-22 and 3.1-67 of the DEIR/SDEIS.
"Bus" category includes public transit, shuttles, and private vans.
- 6) For more information, see Table 3.1-6 of this document, and Table 3.1-6 of the DEIR/SDEIS.
- 7) For more information, see Tables B-39 and B-7 of the DEIR/Technical Appendix.
- 8) LOS after mitigation.

Transit Utilization and Mode Share Percent by Trip Destination. The number and percentage of trips made by transit to SFIA would increase to approximately 33,500, or 14.5 percent under Option B and 33,400, or 14.1 percent, under Option X. These figures represent a 43.8 percent increase and a 43.3 percent increase in transit trips over the No Build Alternative, respectively. The percent increase in mode share attributable to transit is 48.0 percent for Option B, and 44.0 percent for Option X compared to the No Build Alternative.

Trips to downtown San Francisco by transit are projected to increase from 34.9 percent of all trips under No Build assumptions and 37.0 percent under the TSM Alternative, to 40.7 percent for the Aerial Design Option.

Level of Service at Intersections. Level of service (LOS) indicates the ease with which traffic moves through an intersection at a given moment. In 2010, six intersections are projected to be at LOS D under the No Build Alternative, and seven with the TSM Alternative after mitigation. Construction of the Aerial Design Option would result in eight intersections at LOS D. Eight intersections would be at LOS E under the No Build Alternative, Design Option B, or Design Option X. No intersections are projected to be at LOS F under any alternative.

Cost Effectiveness

Cost effectiveness analysis provides a means of comparing the benefits of each alternative with its costs. FTA has established a cost-effectiveness index (CEI) for evaluating the relative merits of fixed guideway alternatives within a corridor. The formula relates capital and operating costs to benefits in the form of travel time savings for existing transit riders and attraction of new riders to transit. The output of the formula is an alternative's cost per new transit rider attracted relative to the TSM Alternative. The lower the cost per new transit rider, the more cost effective an alternative is.

Table 6-7 presents the cost effectiveness indices for Option B and Option X. The CEI for Option B is \$26.32. The CEI for Option X is \$26.12. Both are lower than (preferable to) the CEI of \$28.76 for Alternative VI.

Table 6-7
Cost Effectiveness Index
Millions of 1996 Dollars
Annual Trips and Travel Time Savings for 2010

ALTERNATIVE	Annualized Capital Costs [1]	Change from TSM [2]	Annual O&M Costs [3]	Change from TSM [4]	Annual Travel Time Savings [5]	Annual Transit Trips [6]	Change from TSM [7]	Cost Effectiveness Index [8]
Alternative II TSM	\$19.90	n.a.	\$632.59	n.a.	n.a.	391.37	n.a.	n.a.
1992 LPA	\$99.80	\$79.90	\$656.67	\$24.08	\$7.19	395.19	3.82	\$25.34
1-380 Least-Cost Design Option	\$94.23	\$74.33	\$656.67	\$24.08	\$7.19	395.19	3.82	\$23.88
Alternative III Base Case	\$89.80	\$69.90	\$656.17	\$23.58	\$6.89	395.54	4.17	\$20.78
Alternative IV Airport Aerial East of Highway 101	\$105.61	\$85.71	\$659.77	\$27.18	\$6.86	395.58	4.21	\$25.19
Alternative V Minimum Subway to Millbrae	\$91.86	\$71.96	\$657.47	\$24.88	\$6.59	395.92	4.55	\$19.85
Design Option V-A Minimum Subway to Airport GTC	\$111.80	\$91.90	\$657.47	\$24.88	\$7.39	395.07	3.70	\$29.57
Design Option V-B Minimum Subway to San Bruno	\$84.08	\$64.18	\$653.77	\$21.18	\$7.39	395.39	4.02	\$19.41
Alternative VI Millbrae via International Terminal	\$121.10	\$101.20	\$657.87	\$25.28	\$6.89	395.53	4.16	\$28.76
Option B Aerial into International Terminal	\$105.54	\$85.64	\$662.37	\$29.78	\$6.92	395.50	4.12	\$26.32
Option X Aerial Abutting International Terminal	\$104.09	\$84.19	\$662.07	\$29.48	\$6.87	395.46	4.09	\$26.12

Source: BART West Bay Extensions, 1995.

Notes: Cost Effectiveness Index = $([2] + [4] - [5]) / [7] = [8]$

Chapter 7

Environmental Justice

7.1 INTRODUCTION

This section addresses Executive Order No. 12898 of February 11, 1994 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"). The Executive Order is explained in the text of Chapter 7 of the DEIR/SDEIS.

7.2 COMMUNITY PARTICIPATION

The extensive community participation program described in Chapters 7 and 8 of the DEIR/SDEIS remains in place. An additional public comment period and public hearing will be held for the FRDEIR/S#2SDEIS in Fall 1995.

7.3 IMPACT ANALYSIS

The definitions of terms, neighborhood boundaries, demographic information, and evaluation criteria and methodology are the same as those described in Chapter 7 of the DEIR/SDEIS.

The environmental justice analysis requires a balance test of impacts associated with each alternative/design option on each neighborhood. The comparison is made between alternatives/design options as a whole, and therefore, in contrast with the remainder of this report, this chapter does not concentrate only on those impacts within the Aerial Design Option study area south of Angus Avenue in San Bruno.

Of the 15 neighborhoods located within the project corridor from Colma to Millbrae, three of the neighborhoods can be defined as "high-minority" neighborhoods: Town of Baden (65 percent minority), Fifth Addition (67 percent minority), and Millbrae Gardens (71 percent minority). The remaining neighborhoods are referred to as "mixed-populace" neighborhoods. All neighborhoods in the project corridor except the Fifth Addition are considered low-income neighborhoods.

To take qualitative differences into considerations, this section distinguishes among three categories of impacts:

- residential relocation impacts,
- significant, unmitigable, non-relocation operational impacts (referred to as “operational impacts,” and
- significant, unmitigable construction impacts.

Relocation impacts are accorded the most weight, other operational impacts are assigned somewhat less importance, and construction impacts are considered the least significant due to their relatively short duration.

The relocation study discussion in Chapter 3.2 of the DEIR/SDEIS, and to be included in the Final EIR/EIS will provide the basis for determining assistance and payment to all displaced households and businesses in accordance with state and federal acquisition and relocation laws. BART/SamTrans will attempt to relocate households within a reasonable distance of their original neighborhoods.

Impact Analysis by Neighborhood

The following discussion identifies the neighborhoods that would incur significant, unmitigable impacts from Alternative VI or the Aerial Design Option. Alternative VI results in 208 residential displacements, as does the Design Option (see Table 7-1). Alternative VI results in significant, unmitigable impacts in five neighborhoods, while the Design Option impacts four neighborhoods. Alternative VI imposes significant unmitigable construction impacts (temporary) on 12 neighborhoods, as does the Design Option.

Colma Neighborhoods. The only neighborhood in Colma that would be affected by Alternative VI or the Aerial Design Option is the Meadowbrook area. Operational impacts are limited to visual impacts (Alternative VI or the Aerial Design Option). Construction impacts may consist of visual and noise/vibration impacts (Alternative VI or the Aerial Design Option).

South San Francisco Neighborhoods. Treasure Island would experience no operational impacts from Alternative VI or the Aerial Design Option. Construction impacts may involve visual and noise/vibration impacts from Alternative VI or the Aerial Design Option.

Sunshine Gardens would experience acquisition at two units and disruption of community cohesion from Alternative VI or the Aerial Design Option. Construction impacts may include disruption of local circulation, visual, and noise/vibration impacts from Alternative VI or the Aerial Design Option.

The Town of Baden would be expected to have no operational impacts from Alternative VI or the Aerial Design Option. Disruption of local circulation and noise/vibration impacts may be experienced during construction of Alternative VI or the Aerial Design Option.

Mayfair would experience no operational impacts from Alternative VI or the Aerial Design Option. Construction impact may include disruption of local circulation and noise/vibration.

San Bruno Neighborhoods. The Fifth Addition would experience a disruption of community cohesion from operation of Alternative VI or the Aerial Design Option. Construction impacts may include disruption of local circulation, overall disruption of neighborhood quality, visual, and noise/vibration impacts.

San Bruno Park residents would experience no operational impacts from Alternative VI or the Aerial Design Option. Construction impacts may include restricted access to businesses, disruption of local circulation, visual, and noise/vibration impacts.

The Belle Air neighborhood would have no operational impacts from Alternative VI or the Aerial Design Option. Construction impacts of Alternative VI may include restricted access to businesses, disruption of local circulation, temporary loss of parkland, visual and noise/vibration impacts. The Aerial Design Option construction would not result in loss of parkland, but would include temporary loss of the community garden if laydown yard Alternative A were selected. Laydown yard Alternative B or C would not require temporary use of parkland or the community garden.

Lomita Park would experience no operational impacts from Alternative VI or the Aerial Design Option. Construction of Alternative VI or the Aerial Design Option may result in visual impacts.

Millbrae Neighborhoods. Airport Park would experience no operational or construction impacts from Alternative VI. Under the Aerial Design Option, the neighborhood would experience visual impacts.

Marino Vista would experience visual impacts from both operation and construction of Alternative VI or the Aerial Design Option.

The North Millbrae neighborhood would experience groundborne noise from operation of Alternative V. Construction of Alternative VI may result in vibration impacts. No operational or construction period impacts would be expected for the North Millbrae neighborhood.

The operational impact of Alternative VI or the Aerial Design Option would be the displacement of two Millbrae Manor residential units. There may be visual impacts from construction of Alternative VI.

Bayside Manor would experience the displacement of two residential units and visual impacts from operation of Alternative VI, and the same displacement under the Aerial Design Option. Construction impacts of Alternative VI include overall disruption of neighborhood quality, visual, and noise/vibration impacts.

Millbrae Gardens would experience the displacement of 202 residential units and a loss of community cohesion under Alternative VI or the Aerial Design Option. Construction of Alternative VI or the Aerial Design Option may result in noise/vibration impacts.

Impact Analysis by Alternative

Minority Neighborhoods. Alternative VI would require relocating a total of approximately 208 households in four neighborhoods: the mixed-populace neighborhoods of Sunshine Gardens (two units), Millbrae Manor (two units), and Bayside Manor (two units); and the high-minority Millbrae Gardens (202 units). Operational impacts may occur in six neighborhoods, only two of which are high-minority neighborhoods. Construction would cause impacts in 12 neighborhoods, two of them high-minority. Overall, it does not appear that Alternative VI would cause a disproportionate impact on high-minority neighborhoods. Although 97 percent of the displacements would occur in one high-minority neighborhood, 67 percent of the neighborhoods bearing operational impacts and 83 percent of those incurring construction impacts would be mixed-populace neighborhoods.

The Aerial Design Option would require relocating the same 208 households. Operational impacts may occur in five neighborhoods, only two of which are high-minority neighborhoods. Construction would cause impacts in 12 neighborhoods, two of them high-minority. Overall, it does not appear that the Aerial Design Option would cause a disproportionate impact on high-minority neighborhoods. Although 97 percent of the displacements would occur in one high-minority neighborhood, 60 percent of the neighborhoods bearing operational impacts and 83 percent of those incurring construction impacts would be mixed-populace neighborhoods.

Low-Income Neighborhoods. Alternative VI would require relocating approximately 208 residential units, all of which are in low-income neighborhoods. Operational impacts would occur in six neighborhoods, five of which are low-income. Construction would impact 12 neighborhoods, 11 of which are considered low-income. Consequently, Alternative VI may have disproportionate impacts on low-income neighborhoods.

The Aerial Design Option would require relocating approximately 208 residential units, all of which are in low-income neighborhoods. Operational impacts would occur in five neighborhoods, four of which are low-income. Construction would impact 12 neighborhoods, 11 of which are considered low-income. Consequently, the Aerial Design Option may have disproportionate impacts on low-income neighborhoods.

7.4 CONCLUSION

As discussed in the DEIR/SDEIS and above, the proposed project (1992 LPA) and the I-380 Least Cost Design Option may result in disproportionate impacts on high-minority neighborhoods. None of the other alternatives, including Alternative VI and the Aerial Design Option, would create disproportionate impacts on high minority neighborhoods. Accordingly, Alternative VI and the Aerial Design Option appear to be consistent with the mandate of Executive Order No. 12898 to avoid disproportionate impacts on high-minority neighborhoods.

Alternative VI and the Aerial Design Option may disproportionately impact low-income communities. However, with respect to low income communities, the Executive Order only requires that “[t]o the extent practicable” such impacts shall be “identif[ied] and address[ed], as appropriate...”. Although all of the impacts discussed in this section are unmitigable, these impacts have been appropriately addressed by identifying and analyzing a reasonable range of alternatives. Within the reasonable range of alternatives, only the No Build Alternative would not impose disproportionate impacts on low-income communities in the study area.

Table 7-1
Summary of Residential Displacements and
Significant Unmitigable Operational Impacts on Neighborhoods

	Alternative VI Millbrae Ave. via Airport International Terminal	Option B	Option X
Meadowbrook	Visual	Visual	Visual
Treasure Island	—	—	—
Sunshine Gardens	Cohesion D=2	Cohesion D=2	Cohesion D=2
Town of Baden	—	—	—
Mayfair	—	—	—
Fifth Addition	Cohesion	Cohesion	Cohesion
San Bruno Park	—	—	—
Belle Air	—	—	—
Lomita Park	—	—	—
Airport Park	—	—	—
Marino Vista	—	Visual	Visual
North Millbrae	Groundborne noise	—	—
Millbrae Manor	D=2	D=2	D=2
Bayside Manor	Visual D=2	D=2	D=2
Millbrae Gardens	Cohesion D=202	Cohesion D=202	Cohesion D=202
Total Displacements	208	208	208

Notes:

“D” represents number of residential units displaced.

“Cohesion” impacts refer to the disruption of social patterns of shopping, circulation, and neighborhood activities.

Table 7-2
Summary of Possible Significant Unmitigable Construction Impacts on Neighborhoods

	Alternative VI Millbrae Ave. via Airport International Terminal	Option B	Option X
Mcadowbrook	visual noise and vibration	visual noise and vibration	visual noise and vibration
Treasure Island	visual noise and vibration	visual noise and vibration	visual noise and vibration
Sunshine Gardens	disruption of local circulation visual noise and vibration	disruption of local circulation visual noise and vibration	disruption of local circulation visual noise and vibration
Town of Baden	disruption of local circulation noise and vibration	disruption of local circulation noise and vibration	disruption of local circulation noise and vibration
Mayfair	disruption of local circulation noise and vibration	disruption of local circulation noise and vibration	disruption of local circulation noise and vibration
Fifth Addition	disruption of local circulation overall disruption of neighborhood quality visual noise and vibration	disruption of local circulation visual noise and vibration	disruption of local circulation visual noise and vibration
San Bruno Park	access to businesses disruption of local circulation visual, noise and vibration	disruption of local circulation disruption to businesses visual, noise and vibration	disruption of local circulation disruption to businesses visual, noise and vibration
Belle Air	access to businesses disruption of local circulation visual loss of park noise and vibration	loss of park ¹ access to businesses disruption of local circulation visual loss of park noise and vibration	loss of park ¹ access to businesses disruption of local circulation visual loss of park noise and vibration
Lomita Park	visual	visual	visual
Airport Park	—	visual	visual
Marino Vista	—	visual	visual
North Millbrae	vibration	—	—
Millbrae Manor	visual noise and vibration	—	—
Bayside Manor	overall disruption of neighborhood quality visual noise and vibration	noise and vibration	noise and vibration
Millbrae Gardens	— ²	—	—

Notes:

- 1) Temporary loss of community garden if laydown yard Alternative A selected.
- 2) Incorrectly reported in DEIR/SDEIS.

"Disruption to businesses" is a construction impact that involves partial lane closures, and results in inconvenience to a neighborhood.

"Overall disruption of neighborhood quality" is a construction impact that involves the addition of traffic, noise, and construction vehicle activity in an area adjacent to a neighborhood. This is a distinct impact, and does not incorporate other impacts.

"Visual" impacts include streetscape effects, proximity to sensitive receptors, and loss of significant views or scenic resources.

Chapter 8

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Chapter 9

Distribution List

9.1 FEDERAL AGENCIES

Advisory Council on Historic Preservation	U.S. Department of Housing and Urban Development
Federal Aviation Administration	U.S. Department of Transportation
Federal Highway Administration	U.S. Environmental Protection Agency
Federal Railroad Administration	U.S. Fish and Wildlife Service
Federal Transit Administration	U.S. Geological Survey
U.S. Army Corps of Engineers	U.S. Department of the Interior
U.S. Department of Commerce	U.S. National Park Service
U.S. Department of Energy	U.S. Soil Conservation Service

9.2 STATE AGENCIES

California Air Resources Board	California Energy Commission
California Coastal Commission	California Highway Patrol
California Department of Conservation	California Public Utilities Commission
California Department of Education	California Transportation Commission
California Department of Fish and Game	California Water Resources Control Board
California Department of General Services	Native American Heritage Commission
California Department of Health Services	Public Utilities Commission
California Department of Housing and Community Development	State Cemetery Board
California Department of Parks and Recreation	State Clearinghouse, Office of Planning and Research
California Department of Transportation (Caltrans), District 4	State Lands Commission
California Department of Water Resources	State Office of Historic Preservation

9.3 REGIONAL AGENCIES

Association of Bay Area Governments

Metropolitan Transportation Commission (MTC)

Bay Area Air Quality Management District

San Francisco Bay Conservation and
Development Commission

California Regional Water Quality Control Board,
San Francisco Bay Region

9.4 LOCAL AGENCIES

Bay Area Rapid Transit District (BART)

San Francisco International Airport

City and County of San Francisco

San Francisco Municipal Railway

City of Burlingame

San Francisco Public Utilities Commission

City of Millbrae

San Mateo County Flood Control District

City of San Bruno

San Mateo County Transit District (SamTrans)

City of San Jose

Santa Clara County Traffic Authority

City of South San Francisco

Santa Clara County Transit District

County of San Mateo

Town of Colma

Pacific Gas and Electric Company

Peninsula Joint Powers Board

Advisory Committee Members

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- Jane Baker, MTC
- Councilmember Beverly Barnard, San Bruno
- Michael Bernick, President, BART Board of Directors
- Nello Bianco, former Chairperson/BART Director
- James Fang, BART Director
- Mayor Joe Fernekes, South San Francisco
- Mayor Janet Fogarty, Millbrae
- Councilmember Larry Franzella, San Bruno
- Supervisor Mary Griffin, MTC

Steering Committee Members

- Tom Huening, SamTrans Director
- Mayor Ted Kirschner, Colma
- Frances Liston, Town Manager, Colma
- Mayor Rosalie O'Mahony, Burlingame
- Michael Nevin, SamTrans Director
- Margaret K. Pryor, BART Director
- Councilmember Dan Quigg, Millbrae
- Councilmember Mike Spinelli, Burlingame
- Albert Teglia, Chairman, SamTrans Board of Directors

9.5 ORGANIZATIONS

Bay Area Council	League of Women Voters of San Mateo County
Bay Relations	Millbrae Advisory Committee
Coalition of Colma Cemeteries	Sierra Club

9.6 LIBRARIES

Atherton Branch Library	Millbrae City Library
Belmont Branch Library	MTC - ABAG Library, Oakland
Brisbane Library	Pacifica Branch Library
Burlingame Branch Library	Portola Valley Branch Library
Burlingame Library	Redwood City Library
East Palo Alto Branch Library	San Bruno Public Library
Foster City Branch Library	San Carlos Branch Library
Grand Avenue Branch Library	San Francisco Main Library
Half Moon Bay Library	San Mateo County Library
Hillsdale Branch Library	San Mateo Library
John D. Daly Library	Serramonte Main Branch Library
Institute of Governmental Studies Library, University of California, Berkeley	Westlake Branch Library
Menlo Park Library	West Orange Branch Library
	Woodside Branch Library

9.7 SCHOOLS AND HOSPITALS

Belle Air Elementary School	Los Cerritos Elementary School
El Camino High School	San Bruno Park School District
Kaiser Medical Center	San Mateo Unified High School District
Lomita Park School	South San Francisco High School

GLOSSARY



GLOSSARY

Aerial structure

An above-ground design where tracks (and stations) are supported by columns and/or footings.

Airport Light Rail System (ALRS)

The transit system proposed to be constructed by the San Francisco International Airport in two phases, connecting the terminals and proposed Ground Transportation Center (GTC) with adjacent and remote parking facilities, nearby mass transit systems, proposed Ferry Service, and General Aviation Terminals. (Also called a “people mover,” “automated guideway transit,” or “monorail.”)

Alignment

Horizontal and/or vertical geometric elements which define the location of a roadway or fixed-guideway transit facility.

Alluvium

An unconsolidated, terrestrial sediment composed of sorted or unsorted sand, gravel, and clay that have been deposited by water.

Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR)

An AA/DEIS/DEIR for the BART–San Francisco Airport Extension was prepared under the direction of the Metropolitan Transportation Commission and released for public and agency review in March 1992.

Annualized capital cost

A one time capital cost converted into an annual value which incorporates both the depreciation on the capital item and the foregone interest on the money invested in the project.

At grade

BART or other transit running on the surface at the existing ground level.

At-grade crossing

Any intersection of two or more flows of traffic at the same elevation (possibly involving more than one mode of transportation).

Average daily traffic (ADT)

The total volume of traffic during a given time period divided by the number of days in that same period, representative of average traffic in a one-day time period.

Average wait time

Average time spent by passengers in the station (or stop) waiting for service.

Average weekday

A measurement of average conditions during one weekday.

Background concentration

The air pollutant level that would exist at a site in the absence of other air pollution sources in the vicinity of that site.

British thermal unit (Btu)

An energy unit equal to the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit. One therm equals 100,000 Btu.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act sets forth specific guidelines for the production of an informational document (EIR) which needs to be prepared by an agency and reviewed by decision makers prior to approving a project. The act also requires that each public agency adopt its own objectives, criteria, and procedures to implement the goals and objectives of CEQA.

Capital costs

Nonrecurring costs required to construct transit systems, including costs of right-of-way, facilities, rolling stock, power distribution, administrative and design costs, and financing charges during construction.

Concentration

A measure of the amount of an air pollutant in the ambient air, having the units of mass per volume. (Also, called level.)

Criteria air pollutants

Those air pollutants which have been recognized by the EPA as potentially harmful and for which standards have been set to protect public health and welfare. The criteria air pollutants are carbon monoxide, sulfur dioxide, particulates, nitrogen dioxide, ozone, hydrocarbons, and lead.

Cut and cover

A method of subway construction in which a trench is first excavated, a box structure is constructed within the trench, the trench is backfilled, and the surface is restored.

dBA

The sound level obtained through the use of A-weighting characteristics specified by the American National Standards Institute (ANSI) Standard S1.4-1971. The unit of measure is the decibel (dB), commonly referred to as dBA when A-weighting is used. The "A" weighting scale closely resembles human response to noise.

Design Option

Design variation of a major alignment alternative.

Disturbed habitat

A habitat in which naturally occurring ecological processes and species interactions have been significantly disrupted by the direct or indirect results of human presence and activity.

Draft Environmental Impact Report (DEIR)

An informational document required by CEQA that compares the existing conditions of a proposed project area with the conditions after a proposed project is constructed to determine any impacts which may result from implementation of the project and suggests ways to mitigate those impacts.

Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (DEIR/SDEIS)

For the proposed BART–San Francisco Airport Extension, the draft environmental document satisfying CEQA and NEPA.

Ecologically sensitive area

An area valued locally for its rare or sensitive habitat which exists in a relatively undisturbed, natural state and supports indigenous species.

Elevated guideway

A guideway which is positioned above the normal activity level, e.g., elevated over a street.

Emission control

Method by which emissions are governed in an effort to minimize the amount of pollutants and/or noise emitted.

Emission inventory

A listing by emission source of the amounts of air pollutants released into the atmosphere.

Emission source

The origin of an air pollutant, e.g., automobiles and trucks are sources of carbon monoxide, hydrocarbons, and nitrogen oxides.

Emissions

Particulate, gaseous, noise, or electro-magnetic by-products of transit systems or vehicle.

Endangered species

According to the Federal Endangered Species Act of 1973, endangered species are any species in danger of extinction throughout all or a significant portion of its range, other than an insect determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of this act would present an overwhelming and overriding risk to man.

Energy

The capability of doing work. Forms of energy include kinetic, potential, thermal, electromagnetic, and nuclear. One form of energy may be converted to another; e.g., in hydroelectric plants, the conversion is from potential to kinetic to electromagnetic energy.

Equity

The incidence of fairness and the distribution of costs and impacts among population subgroups.

Fare

The authorized amount (cash or token) paid or valid transfer, pass, etc., presented for a transit ride.

Federal Transit Administration (FTA)

The Lead Agency for the federal environmental process and funding of the BART-San Francisco Airport Extension.

Feeder service

Local transit service which feeds some other (usually faster and higher capacity) transit service.

Grade separated

Parallel or crossing lines of traffic that are vertically separated from each other and do not share a common intersection.

Ground Transportation Center (GTC)

A portion of the San Francisco International Airport's Master Plan that calls for the development of a central point outside the terminal area along the entrance roadway for passengers arriving or departing the airport via rental cars, shuttle vans, and buses.

Headway

The scheduled time separation between two trains both traveling in the same direction on the same track.

Hydrocarbons

Specifically, non-methane hydrocarbons that contribute to the formation of photochemical oxidants (commonly known as smog), primarily ozone.

Interchange

The system of interconnecting ramps between two or more intersecting roadways or gradeways which are grade separated.

Land development pattern

The use, types, and intensity of developments. Land development patterns affect trip demand, average trip length, and therefore energy consumption.

Landscaped habitat

A habitat in urban areas having limited native species. Vegetation generally consists of mowed lawns and exotic trees and bushes.

 L_{dn}

The day/night average noise level.

 L_{eq}

The equivalent steady-state sound level which in a stated period of time would contain the same acoustic energy as the time-varying sound level during the same period.

Level of Service (LOS)

A qualitative measure that represents the collective factors of travel under a particular volume condition. A measure of traffic congestion.

Line source

A general classification of the origin of an air pollutant, e.g., highways and other roads are line sources of carbon monoxide emission.

Load factor

The average ratio of passengers to seats during some specified period of operation of a public transit route.

Local service

A type of operation involving frequent stops and consequent low speeds, the purpose of which is to deliver and pick up transit passengers as close to their destinations or origins as possible.

Locally Preferred Alternative (LPA)

See Proposed Project.

Mid-point of Construction

Mid-point of construction defines the date to which project costs are escalated (inflation is applied). Mid-point of construction is defined separately for each element of project cost, so that elements completed early in construction process reflect least inflation of current costs.

Mitigation

Action taken to reduce or alleviate the negative effects of the construction or operation of a proposed project

Mode

A particular form or method of travel.

Mode split

Forecast of the proportion of total person-trips that would use various modes of transportation, including transit and cars.

Model runs

A computer simulation of the behavior of traffic and transit users used to estimate traffic levels, routes taken, and transit patronage.

National Ambient Air Quality Standards (NAAQS)

A federal limit on levels of atmospheric contamination necessary to protect the public from adverse effects on health (primary standards) and welfare (secondary standards).

National Environmental Policy Act (NEPA)

The federal law that requires an informational document (EIS) to be prepared before a project is undertaken by a federal agency.

National Historic Preservation Act of 1966

The Act which established the National Register and State Historic Preservation programs, and set forth guidelines and regulations for grants and environmental review of projects involving federal funding.

National Register of Historic Places (NRHP)

The official list of the nation's cultural resources worthy of preservation.

No Build Alternative

An alternative that assumes no BART–San Francisco Airport Extension is constructed. Also assumes no changes to the transportation facilities in the study area beyond those elements that will be in operation or under construction by the time the Draft EIR/Supplemental Draft EIS is completed in 1994.

Nonattainment area

An area designated by the EPA as presently violating the National Ambient Air Quality Standards, based on archival air quality data.

Off-peak

Those periods of the day where demand for transit service is not at a maximum.

One hundred year floodplain

An area of land susceptible to flooding during a storm which would historically occur only once every 100 years.

Operating costs

Recurring costs incurred in operating transit systems, including maintenance of facilities and equipment, fuel, supplies, wages and salaries, employee benefits, insurance, taxes, and other administrative costs. Amortization of facilities and equipment is not included.

Operating revenue

The gross income from operation of the transit system including fares, concessions, advertising, etc. Does not include interest from securities, non-recurring income from sale of capital assets, etc.

Operational energy

The energy used for vehicle propulsion, facilities, and maintenance for a specified period, usually one year.

Particulate

See Total Suspended Particulates.

Passenger mile

An amount of travel equivalent to one passenger traveling one mile.

Patronage

The number of person-trips carried by a transit system over a specified time period.

Peak hour

The hour of the day in which the maximum demand for service is experienced, accommodating the largest number of automobiles or transit patrons.

Peak period

A specified time period for which the volume of traffic is greater than that during other similar periods.

Person-trip

A trip made by a person using any travel mode.

Photochemical oxidants (smog)

Gaseous pollutants formed from reactions of hydrocarbons and nitrogen oxides in the presence of sunlight, e.g., ozone.

Point source

A general classification of the origin of an air or water pollutant, usually characterized as smokestacks.

Pollutant

Smoke, dust, fumes, odors, and/or other elements in the ambient air that have potential for harmful effects. (Also, called air contaminant.)

Power

The time rate of energy use.

Project Corridor

The area encompassing all lands generally within a 1/4-mile distance of the project alternative alignments. It is within this area that most of the local impacts would occur.

Project Study area

The geographical segment of Alternative VI south of Angus Avenue in San Bruno to the end of the BART tailtracks in Burlingame.

Retained cut

BART or other transit running below the existing ground level in a below-surface excavation with concrete walls and left open on top.

Right-of-way (ROW)

Land or rights to land used or held for transit operations of public way.

Section 106

A portion of the National Historic Preservation Act of 1966 which establishes a review procedure of cultural resources that may be affected by projects receiving federal funds.

Section 4(f) land

Section 4(f) of the Department of Transportation Act applies to the following properties: any publicly owned land from a public park, recreational area, or wildlife and waterfowl refuge, or any land from an historic site used by the project.

Sensitive receptor

A local area or site which supports activities easily disrupted by audio or visual intrusions or distractions, such as a park, historic landmark, or residential neighborhood.

Subway

BART or other transit totally underground, whether tunneled, excavated, or in a box culvert covered after construction.

Threatened species

According to the Federal Endangered Species Act of 1973, any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Total Suspended Particulates (TSP)

Air pollutants which consist of solid particles (dust, lead, salts, etc.) suspended in the atmosphere. A criteria air pollutant.

Total travel time

The total elapsed time between trip beginning and end.

Transfer

The portion of a trip between two connecting transit lines, both of which are used for completion of the trip.

Transit

A transportation system principally for moving people in an urban area and made available to the public, usually through paying a fare.

Transportation accessibility

Both the ease of movement in a corridor and the proximity of residents to regional jobs.

Travel time

The time required to travel between two points, not including waiting time.

Trip

The one-way movement of one person between origin and destination, including the walk to and from the means of transportation.

Trip length

The number of miles per trip. This is usually an average number for a specified trip type, area, and analysis year.

Vehicle mile

An amount of travel equivalent to one vehicle traveling one mile.

Viewshed

An area from which a facility is generally visible from an array of points (individual viewpoints can be blocked by foreground obstructions, but still be within the general viewshed).

Visually significant areas

A local area that is found to be visually important to the community by virtue of its prominence, distinctive character, vulnerability to change, array of sensitive or high quality landscape elements (natural or built), or other appearance factors.

Wetlands

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and similar areas.

APPENDIX A
BART Station Entries and Exits

Appendix Table A
Alternative VI Aerial Design Option
BART Station Entries and Exits (1)
Daily Volumes by Access Mode and Trip Purpose

	1993 (Base Year)		1998 (Year of Opening)		2010 (Horizon Year)	
	Productions	Attractions	Productions	Attractions	Productions	Attractions
Daly City BART Station						
Home-Based Work						
Walk	936	180	985	195	1,029	213
Auto	4,761	—	5,007	—	5,232	—
Transit	2,096	584	2,204	634	2,303	693
TOTAL	7,793	764	8,196	829	8,564	906
Non-Work						
Walk	444	113	467	123	488	134
Auto	980	—	1,031	—	1,077	—
Transit	980	534	1,031	580	1,077	634
TOTAL	2,404	647	2,528	703	2,642	768
Air Passengers						
Walk	13	13	15	15	19	19
Auto	68	68	80	80	99	99
Transit	75	75	87	87	108	108
TOTAL	156	156	183	183	226	226
TOTAL						
Walk	1,394	306	1,467	333	1,536	366
Auto	5,810	68	6,118	80	6,408	99
Transit	3,150	1,193	3,322	1,302	3,488	1,435
TOTAL	10,353	1,567	10,907	1,715	11,432	1,900

	1993 (Base Year)		1998 (Year of Opening)		2010 (Horizon Year)	
	Productions	Attractions	Productions	Attractions	Productions	Attractions
Colma BART Station						
Home-Based Work						
Walk	1,084	196	1,140	212	1,191	232
Auto	5,170	—	5,437	—	5,681	—
Transit	5,328	455	5,603	494	5,855	540
TOTAL	11,582	651	12,180	706	12,727	772
Non-Work						
Walk	376	93	395	101	413	110
Auto	748	—	787	—	822	—
Transit	748	441	787	479	822	523
TOTAL	1,872	534	1,969	579	2,057	633
Air Passengers						
Walk	—	—	—	—	—	—
Auto	—	—	—	—	—	—
Transit	6	6	6	6	8	8
TOTAL	6	6	6	6	8	8
TOTAL						
Walk	1,460	288	1,535	313	1,604	342
Auto	5,918	—	6,223	—	6,503	—
Transit	6,082	902	6,396	979	6,685	1,071
TOTAL	13,459	1,190	14,155	1,292	14,792	1,413

Source: MTC, BART-SFO AA/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO SDEIS/DEIR Patronage Forecasts, October 1993
Parsons Brinckerhoff, December 1993

(1) "Production and Attraction" format used. Productions are those trips where the station is at the home end of the trip. Attractions are those trips where the station is at the destination end of the trip.

Appendix Table A (cont'd)
Alternative VI Aerial Design Option
BART Station Entries and Exits (1)
Daily Volumes by Access Mode and Trip Purpose

	1993 (Base Year)		1998 (Year of Opening)		2010 (Horizon Year)	
	Productions	Attractions	Productions	Attractions	Productions	Attractions
Hickey BART Station						
Home-Based Work						
Walk	1,660	126	1,746	137	1,824	150
Auto	2,878	—	3,027	—	3,163	—
Transit	301	489	317	531	331	580
TOTAL	4,839	615	5,089	668	5,318	730
Non-Work						
Walk	527	195	554	211	579	231
Auto	348	—	366	—	382	—
Transit	349	268	367	291	383	318
TOTAL	1,223	463	1,286	502	1,344	549
Air Passengers						
Walk	—	—	—	—	—	—
Auto	—	—	—	—	—	—
Transit	8	8	10	10	12	12
TOTAL	8	8	10	10	12	12
TOTAL						
Walk	2,187	321	2,300	349	2,403	381
Auto	3,226	—	3,393	—	3,545	—
Transit	658	765	693	831	726	910
TOTAL	6,071	1,086	6,385	1,180	6,674	1,291

	1993 (Base Year)		1998 (Year of Opening)		2010 (Horizon Year)	
	Productions	Attractions	Productions	Attractions	Productions	Attractions
Tanforan BART Station						
Home-Based Work						
Walk	72	375	76	407	79	445
Auto	1,980	—	2,082	—	2,176	—
Transit	151	4,348	159	4,720	166	5,158
TOTAL	2,203	4,723	2,317	5,127	2,421	5,603
Non-Work						
Walk	66	385	69	418	72	457
Auto	302	—	318	—	332	—
Transit	302	494	318	536	332	586
TOTAL	670	879	704	954	736	1,043
Air Passengers						
Walk	—	—	—	—	—	—
Auto	—	—	—	—	—	—
Transit	4	4	5	5	6	6
TOTAL	4	4	5	5	6	6
TOTAL						
Walk	137	760	145	825	151	902
Auto	2,282	—	2,400	—	2,508	—
Transit	457	4,846	481	5,261	504	5,750
TOTAL	2,877	5,607	3,026	6,086	3,163	6,652

Source: MTC, BART-SFO AA/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO SDEIS/DEIR Patronage Forecasts, October 1993
Parsons Brinckerhoff, December 1993

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Appendix Table A (cont'd)
Alternative VI Aerial Design Option
BART Station Entries and Exits (1)
Daily Volumes by Access Mode and Trip Purpose

	1993 (Base Year)		1998 (Year of Opening)		2010 (Horizon Year)	
	Productions	Attractions	Productions	Attractions	Productions	Attractions
Airport International Terminal BART Station						
Home-Based Work						
Walk	—	1,000	—	1,387	—	1,727
Auto	—	—	—	—	—	—
Transit	17	1,446	24	2,006	30	2,498
TOTAL	17	2,446	24	3,393	30	4,225
Non-Work						
Walk	—	716	—	993	—	1,236
Auto	—	—	—	—	—	—
Transit	119	1,036	165	1,437	206	1,790
TOTAL	119	1,752	165	2,430	206	3,026
Air Passengers						
Walk	2,884	2,884	3,386	3,386	4,180	4,180
Auto	—	—	—	—	—	—
Transit	726	726	852	852	1,052	1,052
TOTAL	3,610	3,610	4,238	4,238	5,232	5,232
TOTAL						
Walk	2,884	4,600	3,386	5,765	4,180	7,143
Auto	—	—	—	—	—	—
Transit	863	3,209	1,042	4,295	1,288	5,340
TOTAL	3,747	7,808	4,427	10,060	5,468	12,483
<hr/>						
	1993 (Base Year)		1998 (Year of Opening)		2010 (Horizon Year)	
	Productions	Attractions	Productions	Attractions	Productions	Attractions
Millbrae Avenue BART Station						
Home-Based Work						
Walk	44	935	46	1,015	48	1,109
Auto	4,963	—	5,219	—	5,454	—
Transit	9,964	4,170	10,478	4,527	10,949	4,947
TOTAL	14,970	5,105	15,744	5,541	16,451	6,056
Non-Work						
Walk	73	178	77	193	80	211
Auto	1,311	—	1,379	—	1,441	—
Transit	4,134	1,102	4,348	1,196	4,543	1,307
TOTAL	5,518	1,280	5,803	1,389	6,064	1,518
Air Passengers						
Walk	—	—	—	—	—	—
Auto	—	—	—	—	—	—
Transit	1,034	1,034	1,213	1,213	1,498	1,498
TOTAL	1,034	1,034	1,213	1,213	1,498	1,498
TOTAL						
Walk	116	1,113	122	1,208	128	1,320
Auto	6,274	—	6,599	—	6,895	—
Transit	15,131	6,306	16,039	6,936	16,990	7,752
TOTAL	21,522	7,419	22,760	8,144	24,013	9,072

Source: MTC, BART-SFO AA/DEIR Patronage Forecasts, May 1991
MTC, BART-SFO SDEIS/DEIR Patronage Forecasts, October 1993
Parsons Brinckerhoff, December 1993

- (1) "Production and Attraction" format used. Productions are those trips where the station is at the home end of the trip. Attractions are those trips where the station is at the destination end of the trip.



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Subscription price, Five Dollars per Annum in Advance. Single Copies, Fifteen Cents.

Entered as Second-Class Matter, May 26, 1894. Postpaid at Special Rate of \$3.75 per Annum.

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APPENDIX B
Intersection Level of Service

Appendix Table B
Alternative VI Aerial Design Option
Intersection Level of Service (LOS)

Intersection	Intersection Control Type(1)	AM Peak Hour			PM Peak Hour		
		1993	1998	2010	1993	1998	2010
3. El Camino Real & Hickey Blvd	TS	A	A	A	B	B	B
4. El Camino Real & Hickey Extn	TS	A	A	A	B	B	B
5. Hickey Sta. Exit & Hickey Extn	US	B	B	B	E*	F*	F*
6. Mission & Hickey Extension	TS	A	A	A	A	A	A
7. Mission & Hickey Sta. Entr. (KNR)	US	A	A	A	A	A	A
9. Mission & Hickey Sta. Exit (KNR)	US	B	B	B	B	C	C
8. Mission & Evergreen	AWS	A	B	B	A	A	A
11. Mission & New Street	AWS	C	C	C	B	B	B
12. Hickey Sta. Bus Entr. & New Street	US	C	C	C	A	A	B
10. Hickey Sta. Entr. & New Street	US	A	A	A	B	B	B
13. El Camino Real & New Street	TS	A	A	A	A	A	A
14. Mission & Grand	AWS	B	B	B	B	B	B
15. Oak & Grand	US	B	B	B	B	C	C
16. Chestnut & Grand Ave	TS	B	B	B	D	E	E
17. Mission & Chestnut Sta. Entr.	N/A	-	-	-	-	-	-
18. Mission & Chestnut Sta. Exit	N/A	-	-	-	-	-	-
19. Mission & Oak	US	B	B	B	A	A	A
20. Station Bus Ent. & Arroyo/Oak Extn	N/A	-	-	-	-	-	-
21. El Camino Real & Arroyo	TS	A	A	A	A	A	A
22. Camaritas & Arroyo	AWS	B	B	B	A	B	B
23. Junipero Serra Blvd & Westborough	TS	C	C	C	E	E	E
24. Camaritas & Westborough	TS	A	A	A	A	A	B
25. El Camino Real & Westborough	TS	B	B	B	C	C	C
26. Antonette & Chestnut	TS	A	A	A	A	A	A
27. Mission & Chestnut	TS	A	A	A	A	A	A
28. El Camino Real & Orange	TS	A	A	A	C	C	C
29. El Camino Real & Spruce	TS	A	A	A	B	C	C
30. Huntington & Spruce	TS	A	A	A	A	A	A
31. El Camino Real & Noor	US	B	C	C	E	E	E
32. Huntington & Noor	TS	A	A	A	A	A	A
33. Northbound I-280 & Sneath	TS	A	B	B	B	B	B
81. Southbound I-280 & Sneath	TS	D	D	D	B	B	B
34. El Camino Real & Sneath	TS	B	B	B	E*	E*	E**
35. Huntington & Tanforan Sta. Exit	N/A	-	-	-	-	-	-
36. Huntington & Sneath	TS	A	A	A	D	D	D
37. Huntington & Tanforan Sta. Entr.	N/A	-	-	-	-	-	-
38. Dollar/Herman & Tanforan Ave	US	A	A	A	A	A	A

Source: Parsons Brinckerhoff, April 1994.

* Identifies Significant Direct Project Impacts

** Identifies Significant Cumulative Project Impacts

1) TS - Traffic Signal

US - Unsignalized (Minor street stop signs -- LOS is for worst minor street movement)

AWS - All Way Stop (Stop signs on all approaches)

N/A - Not Applicable

Appendix Table B (cont'd)
Alternative VI Aerial Design Option
Intersection Level of Service (LOS)

Intersection	Intersection Control Type(1)	AM Peak Hour			PM Peak Hour		
		1993	1998	2010	1993	1998	2010
40. El Camino Real & Westbound I-380	TS	A	A	A	A	A	A
41. El Camino Real & Eastbound I-380	TS	A	A	A	A	A	A
42. Herman & Scott	AWS	A	A	A	A	A	B
43. Huntington & Forest	AWS	A	A	A	D	D	D
44. Northbound I-280 & San Bruno	TS	A	A	A	A	A	A
82. Southbound I-280 & San Bruno	TS	A	A	A	A	A	A
45. El Camino Real & San Bruno	TS	A	A	A	B	B	B
47. Huntington & San Bruno	TS	A	A	B	A	A	A
48. San Mateo & San Bruno	TS	B	B	B	A	B	B
106. San Mateo & Lumber Yd KNR Ent.	N/A	-	-	-	-	-	-
107. San Mateo & Lumber Yd KNR Exit	N/A	-	-	-	-	-	-
53. San Mateo & Lumber Yard Entr.	N/A	-	-	-	-	-	-
49. Second & San Bruno	TS	D	D	D	E	E	E
50. Third & San Bruno	TS	A	A	A	A	A	A
59. San Mateo & First	US	A	A	A	A	A	A
60. San Mateo & Huntington	US	C	D	D	D	D	D
61. San Mateo & Angus	AWS	B	B	B	C	D	D
62. Huntington & Angus	AWS	B	B	B	C	C	D
63. First & Angus	US	A	A	A	B	C	C
54. So. Airport & I-380 On-Ramp	TS	A	A	A	A	B	C
55. So. Airport & I-380 Off-Ramp	TS	A	A	A	A	A	A
56. So. Airport & San Bruno	TS	A	A	A	A	A	A
57. McDonnell & North BART Ent.	N/A	-	-	-	-	-	-
58. McDonnell & South BART Ent.	N/A	-	-	-	-	-	-
64. El Camino Real & Jenevein	TS	A	A	A	A	A	A
65. El Camino Real & San Felipe	TS	A	A	A	A	A	A
66. Huntington & San Felipe	US	A	A	A	A	A	A
67. El Camino Real & Santa Inez	TS	A	A	A	A	A	A
68. San Antonio (Hunt.) & Santa Inez	US	A	A	A	A	A	A
69. El Camino Real & Center	TS	A	A	A	A	A	A
70. San Anselmo & Center	US	A	A	A	A	A	A
71. Monterey & Center	US	A	A	A	A	A	A
108. Bay & Center	N/A	-	-	-	-	-	-
72. El Camino Real & Millbrae	TS	D	E*	E*	D	D	D
109. New Road & NB 101 Off-Ramp	AWS	-	-	-	-	-	-
110. New Road & SB 101 Ramps	AWS	-	-	-	-	-	-
111. New Road & SFO Sta. Exit	US	-	-	-	-	-	-
112. New Road & SFO Sta. Ent/Exit	AWS	-	-	-	-	-	-

Source: Parsons Brinckerhoff, April 1994.

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1) TS - Traffic Signal

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AWS - All Way Stop (Stop signs on all approaches)

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Appendix Table B (cont'd)
Alternative VI Aerial Design Option
Intersection Level of Service (LOS)

Intersection	Intersection Control	AM Peak Hour			PM Peak Hour		
	Type(1)	1993	1998	2010	1993	1998	2010
80. Rollins & Millbrae	TS	B	C	C	C	C	C
118. Dollar & So. Linden	N/A	-	-	-	-	-	-
119. San Mateo & Produce/Airport Blvd	TS	A	A	A	C	C	C
123. El Camino Real & Hillcrest	TS	A	A	A	A	A	A
127. El Camino Real & Murchison	TS	D	D	D	C	C	C
128. California & Murchison	US	A	A	A	C	C	C
130. El Camino Real & Trousdale	TS	B	B	C	B	B	B
133. El Camino Real & Broadway	TS	A	A	A	A	A	A
134. California & Broadway	TS	D	D	D	D	D	E
135. Rollins & Broadway	TS	B	C	C	C	C	C
146. Rollins & BART Access (Garden Ln)	TS	A	A	A	A	A	A
162. Huntington & Tanforan Dwy North	US	D	D	D	F*	F*	F*
163. Huntington & BART Entrance	TS	A	A	A	A	A	A
164. Huntington & BART Exit	TS	A	A	A	A	A	A
165. Huntington & Tanforan Dwy South	US	A	A	A	D	D	D
166. Rollins & Adrian	TS	A	A	A	A	A	A

Source: Parsons Brinckerhoff, April 1994.

* Identifies Significant Direct Project Impacts

** Identifies Significant Cumulative Project Impacts

1) TS - Traffic Signal

US - Unsignalized (Minor street stop signs – LOS is for worst minor street movement)

AWS - All Way Stop (Stop signs on all approaches)

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BART – SAN FRANCISCO AIRPORT EXTENSION

FOCUSED RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/
SUPPLEMENTAL #2 DRAFT ENVIRONMENTAL IMPACT STATEMENT

DESIGN APPENDIX – CONCEPTUAL DESIGN DRAWINGS

SEPTEMBER, 1995

2. SYNTAX OF PROPOSITIONS

PROPOSITIONS ARE
STATEMENTS

PROPOSITIONS ARE
STATEMENTS

OPTION X OR B

AERIAL DESIGN OPTION INTO INTERNATIONAL AIRPORT

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FOR OPTION B ONLY

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OPTION X OR B

AERIAL DESIGN OPTION INTO INTERNATIONAL AIRPORT

TYPICAL SECTIONS

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CADD FILENAME: WEA00930 CADD DATE: 12SE95



SAN FRANCISCO AIRPORT EXTENSION

FRDEIR/S#2DEIS

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS

BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN

1000 BROADWAY, 4TH FLOOR

OAKLAND CA 94604

(510) 874-7300

INDEX OF FIGURES

DATE:

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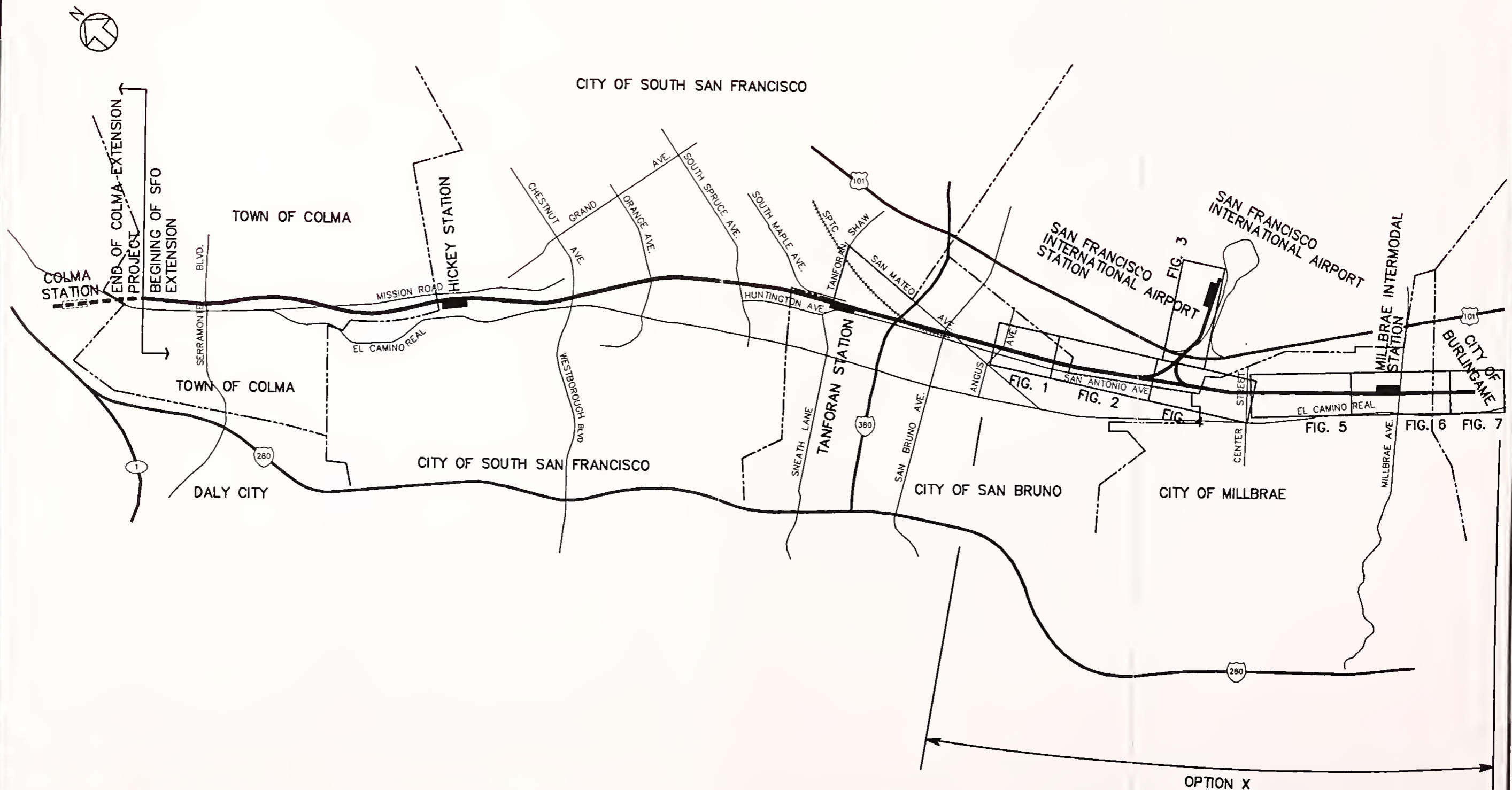
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FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION INTO INTERNATIONAL AIRPORT
LOCATION MAP

NOT TO SCALE

OPTION X
DATE:



CADD FILENAME: WEAOC901 CADD DATE: 14SEP95



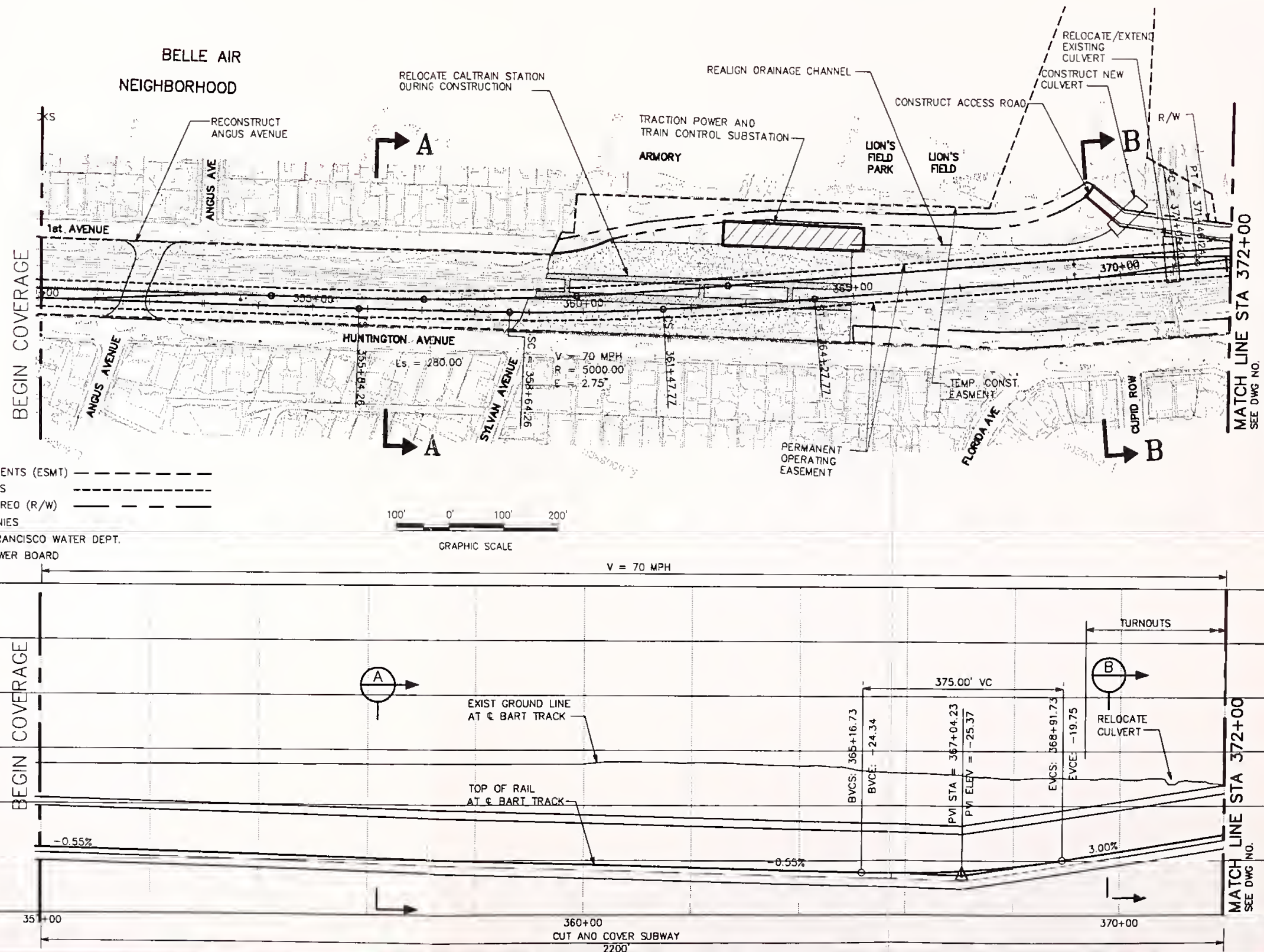
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BAY AREA TRANSIT CONSULTANTS
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1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B
PLAN AND PROFILE
STA 350+00 TO STA 372+00

1"=100'H
1"=20'V

FIGURE 1
DATE:



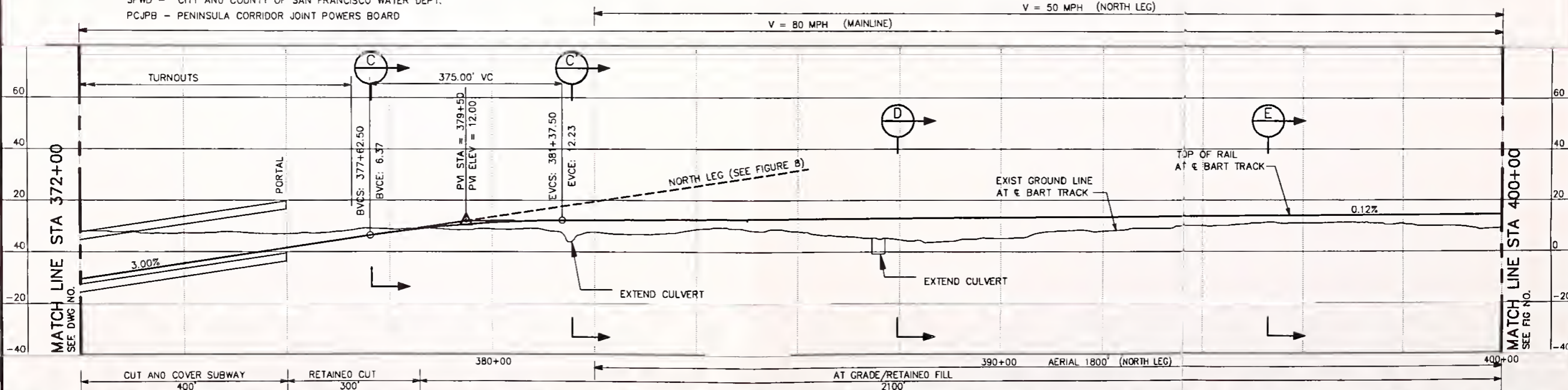
CADD FILENAME: MCA00942 CADD DATE: 19SE95



MATCH LINE STA 372+00
SEE DWG NO. 1

MATCH LINE STA 400+00
SEE FIG NO. 3

LEGEND:
LIMITS OF TEMPORARY CONSTRUCTION EASEMENTS (ESMT) ———
LIMITS OF PERMANENT OPERATING EASEMENTS ———
LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W) ———
SPTC - SOUTHERN PACIFIC TRANSPORTATION CO.
SFWD - CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
PCJPB - PENINSULA CORRIDOR JOINT POWERS BOARD



SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

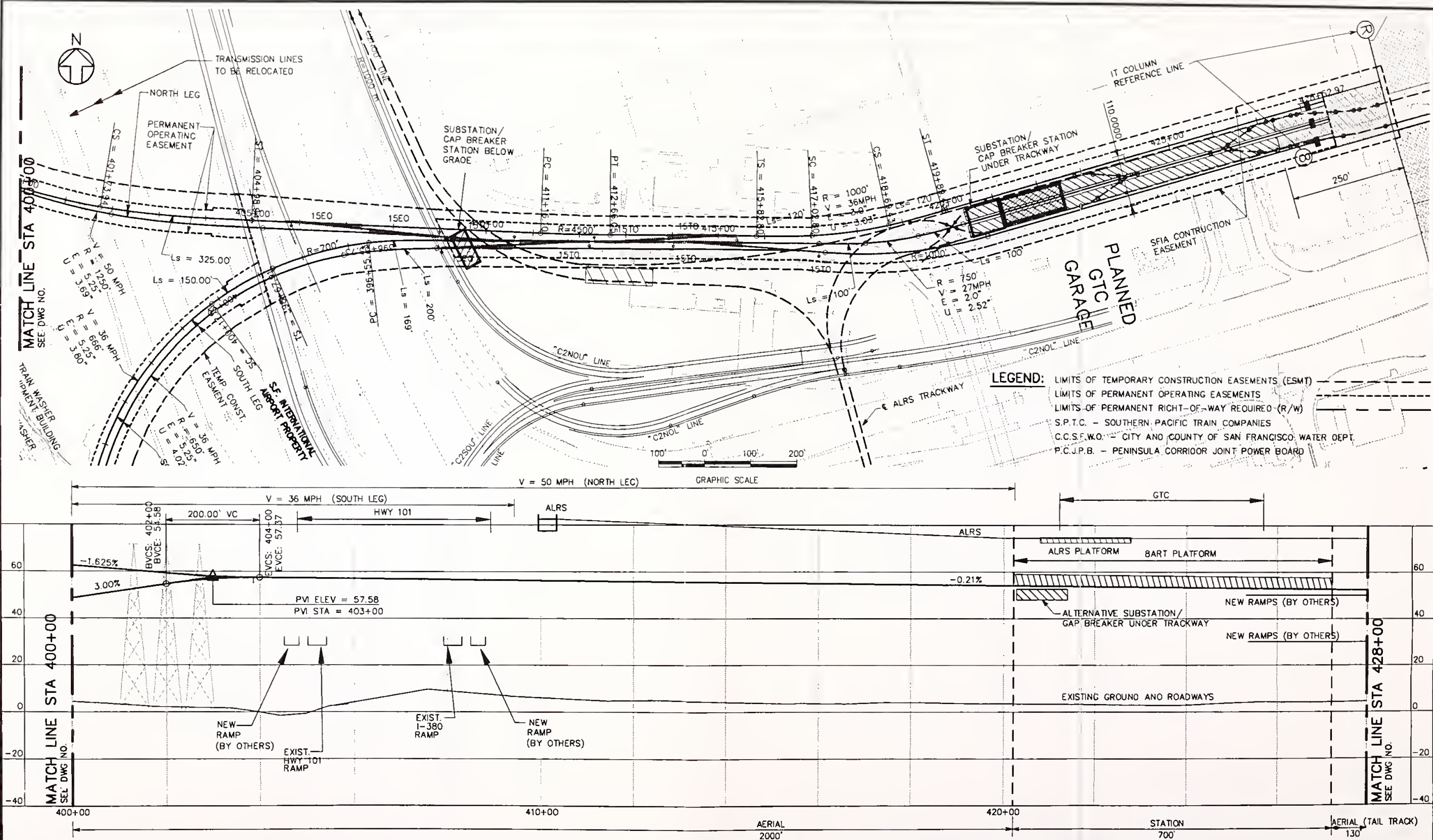
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BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B
PLAN AND PROFILE
STA 372+00 TO STA 400+00

1"=100'H
1"=20'V

FIGURE 2
DATE:

CADD FILENAME: WEA00903 CADD DATE: 14SE95



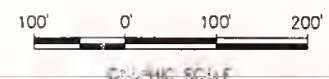
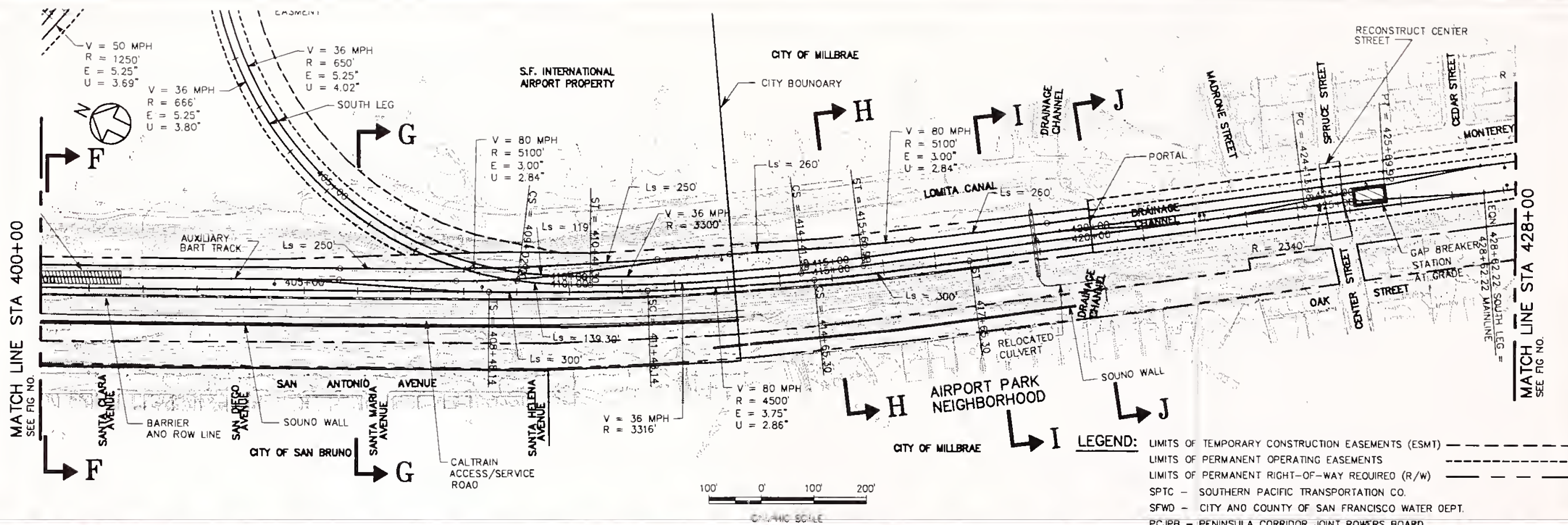
SAN FRANCISCO AIRPORT EXTENSION FRDEIR/S#2DEIS SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

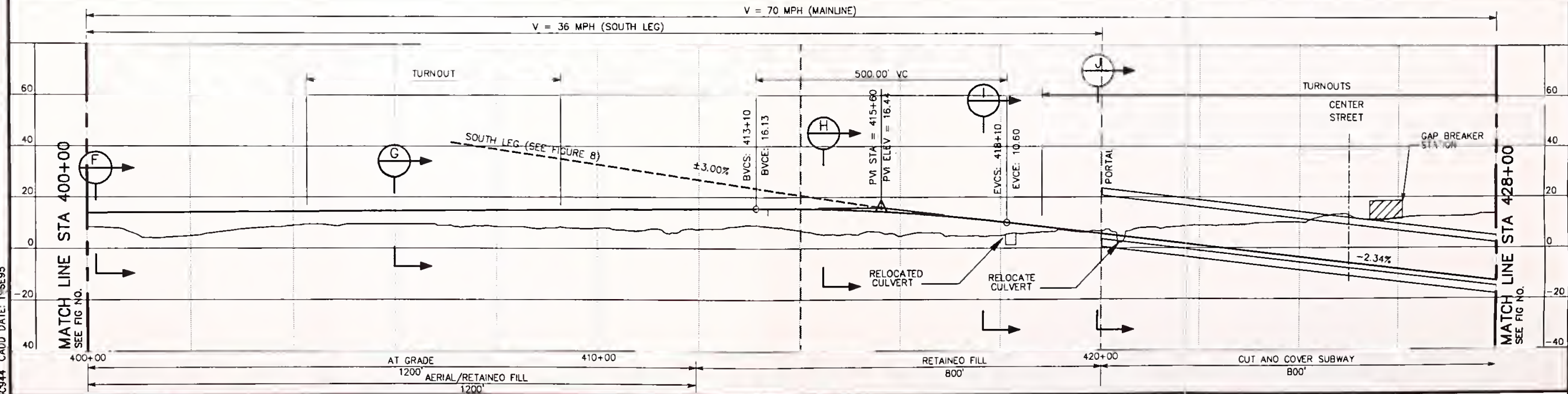
AERIAL DESIGN OPTION X
PLAN AND PROFILE
STA 400+00 TO STA 429+00

1"=100'H
1"=20'V
FIGURE 3
DATE:

CADD FILENAME: WEA00944 CADD DATE: 1/5/95



- LEGEND:**
- LIMITS OF TEMPORARY CONSTRUCTION EASEMENTS (ESMT) - Dashed line
 - LIMITS OF PERMANENT OPERATING EASEMENTS - Dashed line
 - LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W) - Solid line
 - SPTC - SOUTHERN PACIFIC TRANSPORTATION CO.
 - SFWD - CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
 - PCJPB - PENINSULA CORRIDOR JOINT POWERS BOARD

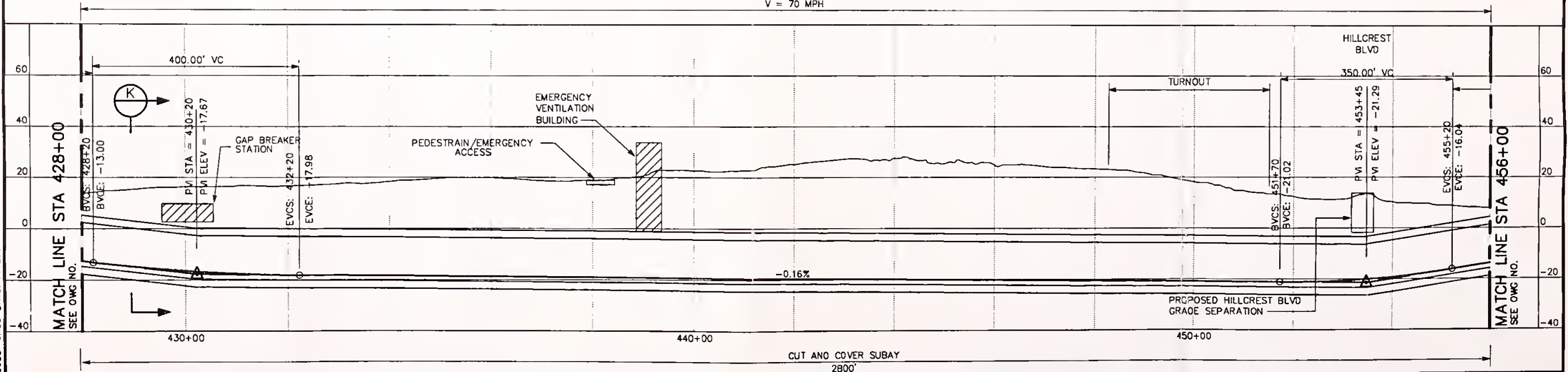
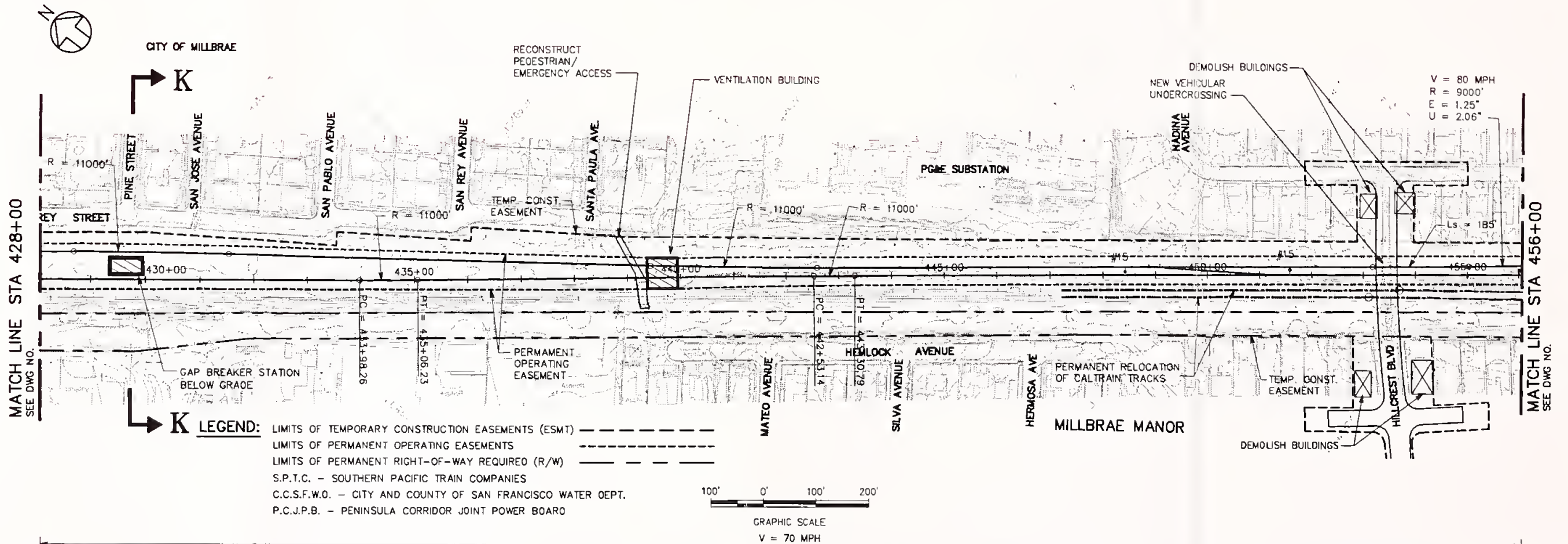


SAN FRANCISCO AIRPORT EXTENSION FRDEIR/S#2DEIS SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B PLAN AND PROFILE STA 400+00 TO STA 428+00

1"=100'H
1"=20'V
FIGURE 4
DATE:



SAN FRANCISCO AIRPORT EXTENSION **FRDEIR/S#2DEIS** SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
 BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
 1000 BROADWAY, 4TH FLOOR
 OAKLAND, CA 94604
 (510) 874-7300

AERIAL DESIGN OPTION X OR B
 PLAN AND PROFILE
 STA 428+00 TO STA 456+00

1"=100'H
 1"=20'V

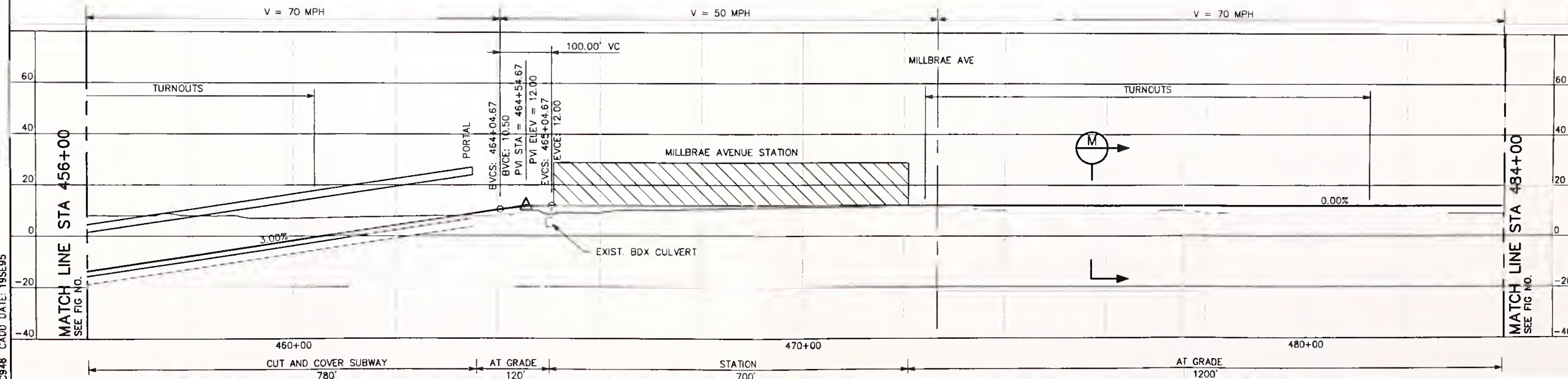
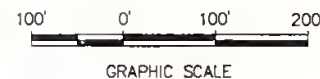
FIGURE 5
 DATE:

CADD FILENAME: WEAOC948 CADD DATE: 19SE95

MATCH LINE STA 456+00
SEE FIG NO. 5

MATCH LINE STA 484+00
SEE FIG NO. 7

- LEGEND:**
- LIMITS OF TEMPDRARY CONSTRUCTION EASEMENTS (ESMT) - - - - -
 - LIMITS OF PERMANENT OPERATING EASEMENTS - - - - -
 - LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W) - - - - -
 - SPTC - SOUTHERN PACIFIC TRANSPORTATION CO.
 - SFWD - CITY AND CDUNTY DF SAN FRANCISCO WATER DEPT.
 - PCJPB - PENINSULA CORRIDOR JOINT POWERS BDARO



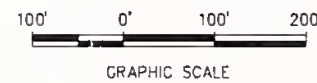
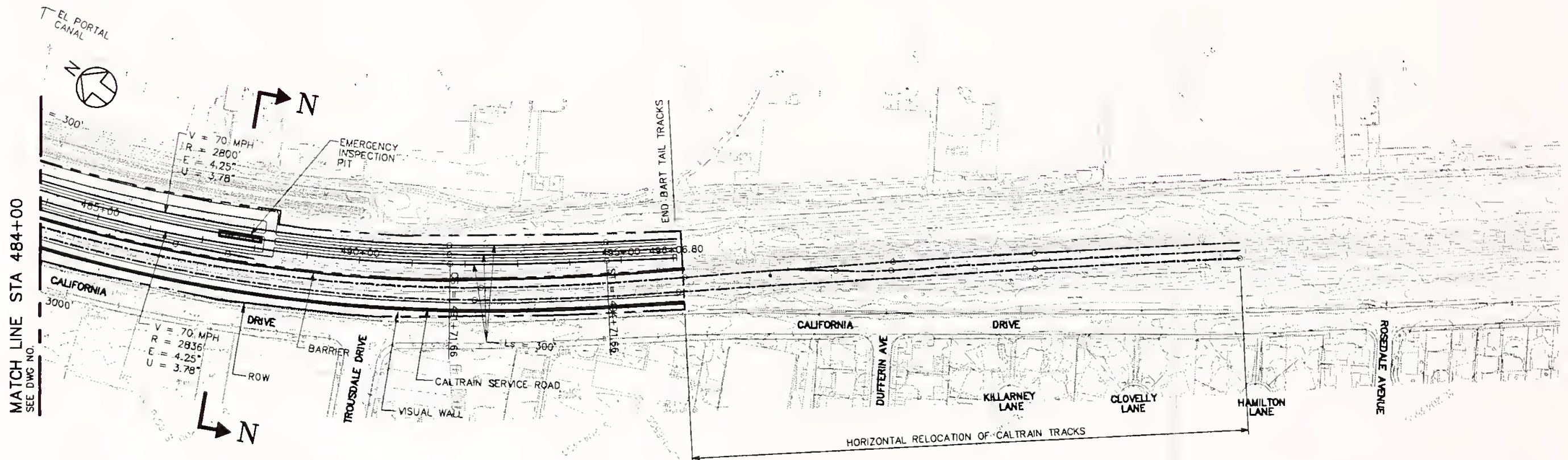
SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLDDR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B
PLAN AND PROFILE
STA 456+00 TO STA 484+00

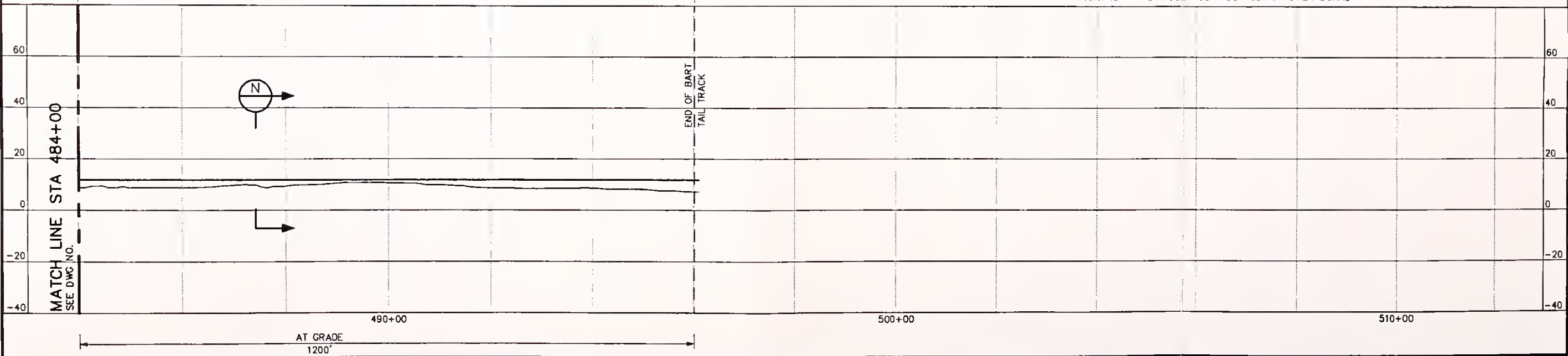
1"=100'H
1"=20'V
FIGURE 6
DATE:

CADD FILENAME: WEACC907 CADD DATE: 14SEP95



- LEGEND:**
- LIMITS OF TEMPORARY CONSTRUCTION EASEMENTS (ESMT) ———
 - LIMITS OF PERMANENT OPERATING EASEMENTS ———
 - LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W) ———
 - S.P.T.C. — SOUTHERN PACIFIC TRAIN COMPANIES
 - C.C.S.F.W.D. — CITY AND COUNTY OF SAN FRANCISCO WATER DEPT.
 - P.C.J.P.B. — PENINSULA CORRIDOR JOINT POWER BOARD

V = 70 MPH



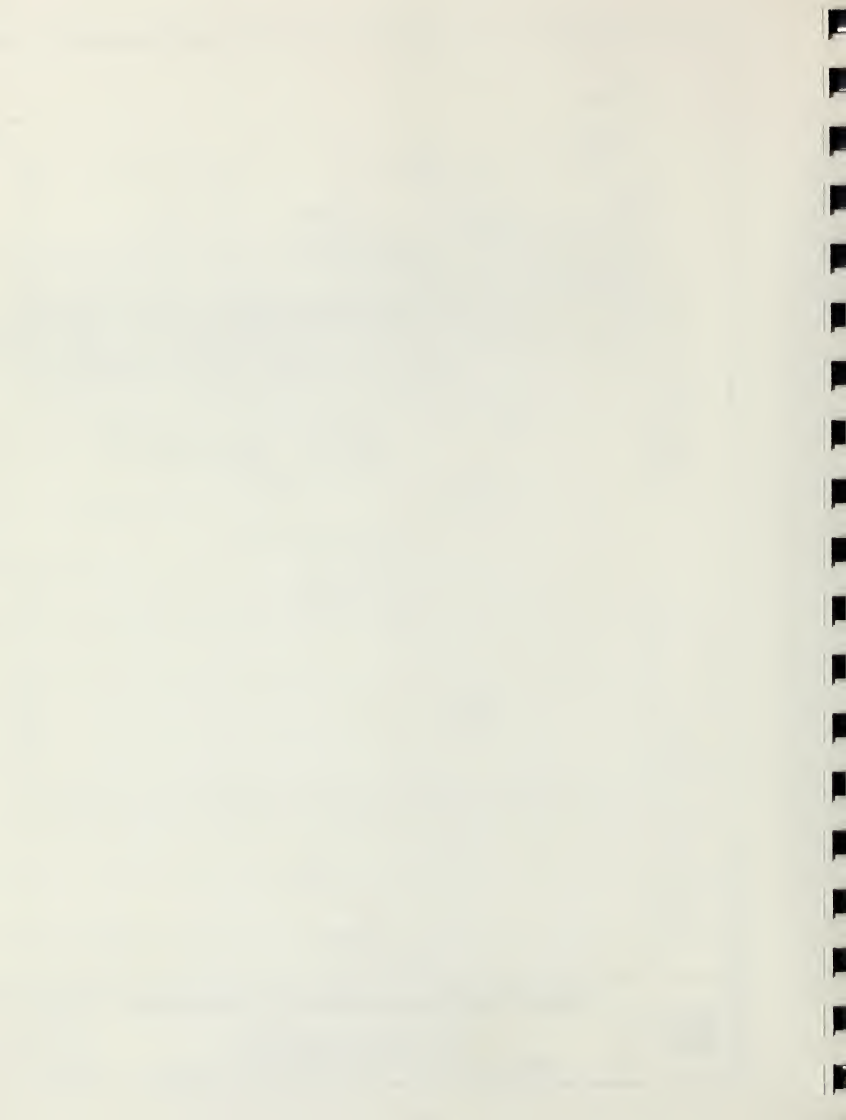
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FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B
PLAN AND PROFILE
STA 484+00 TO STA 496+00

1"=100'H
1"=20'V

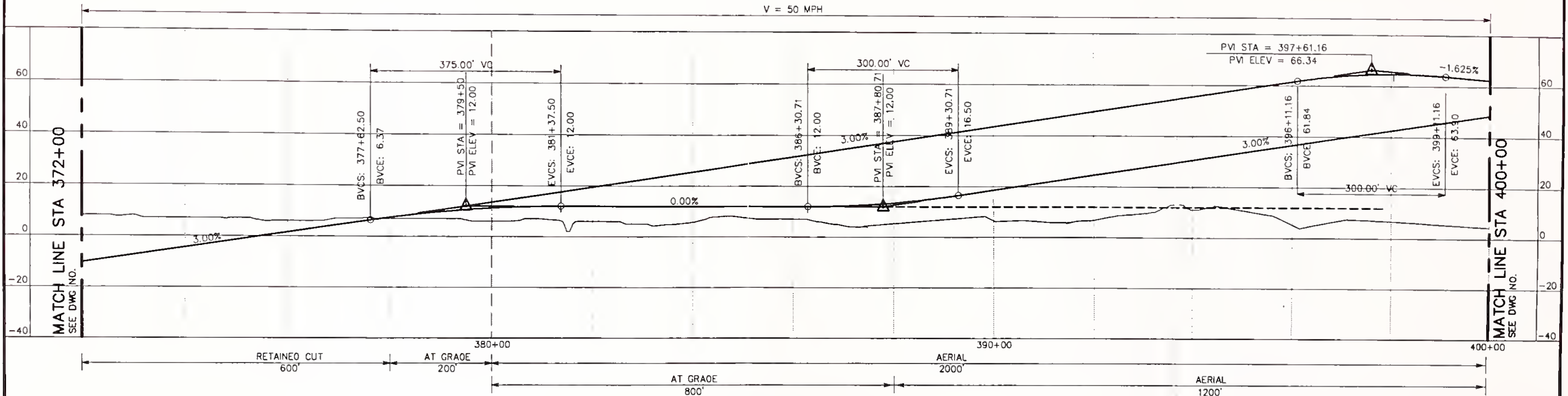
FIGURE 7
DATE:



CADD FILENAME: WEAOC908 CADD DATE: 14SE95

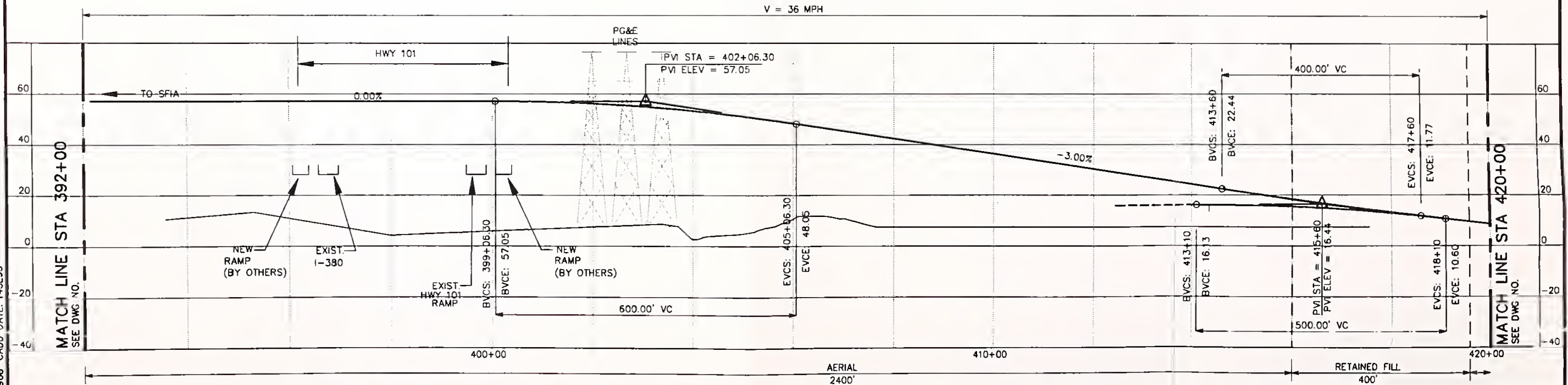
NORTH LEG

V = 50 MPH



SOUTH LEG

V = 36 MPH



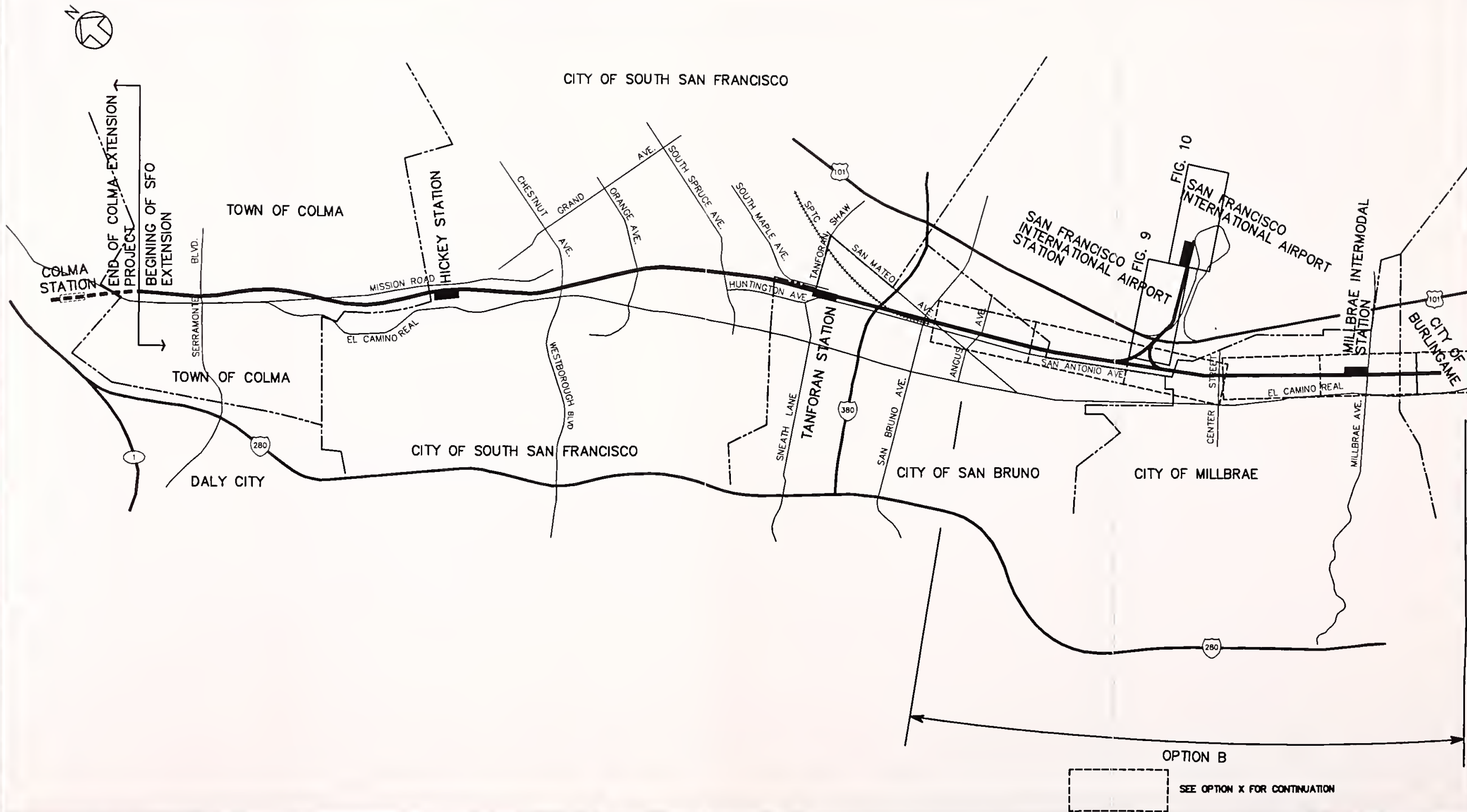
SAN FRANCISCO AIRPORT EXTENSION
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1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X
PROFILE
STA 372+00 TO STA 420+00

1"=100'H
1"=20'V

FIGURE 8
DATE:



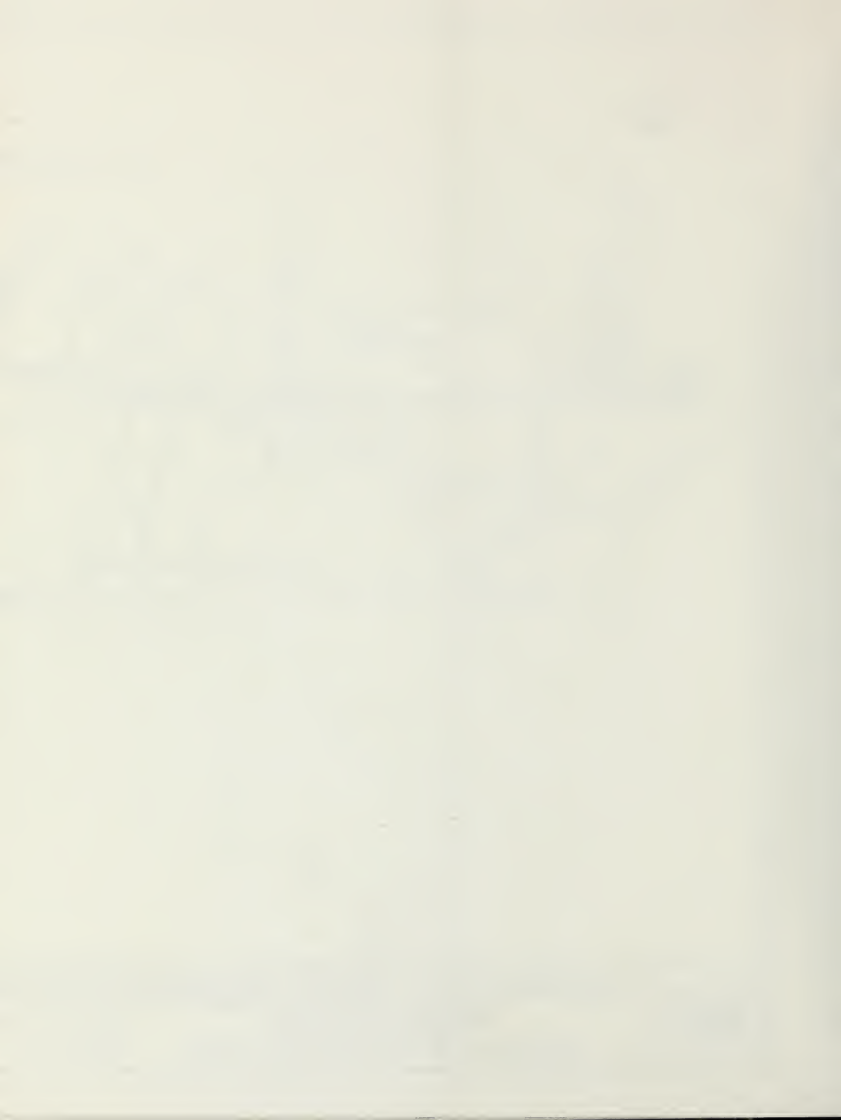
SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
 SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
 BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
 1000 BROADWAY, 4TH FLOOR
 OAKLAND CA 94604
 (510) 874-7300

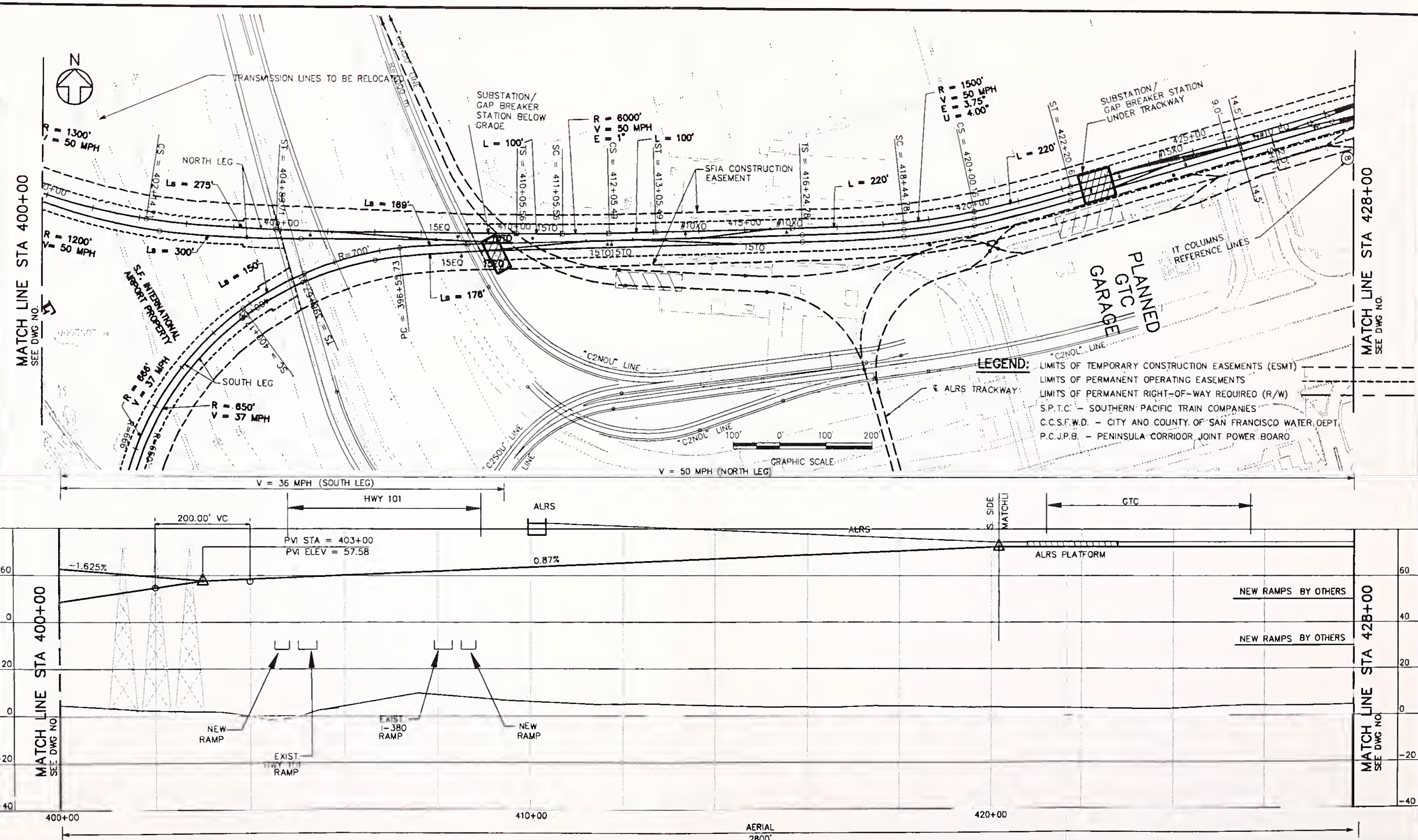
AERIAL DESIGN OPTION INTO INTERNATIONAL AIRPORT
 LOCATION MAP

NOT TO SCALE

OPTION B
 DATE:



CADD FILENAME: WEAC0923 CADD DATE: 14SEP95



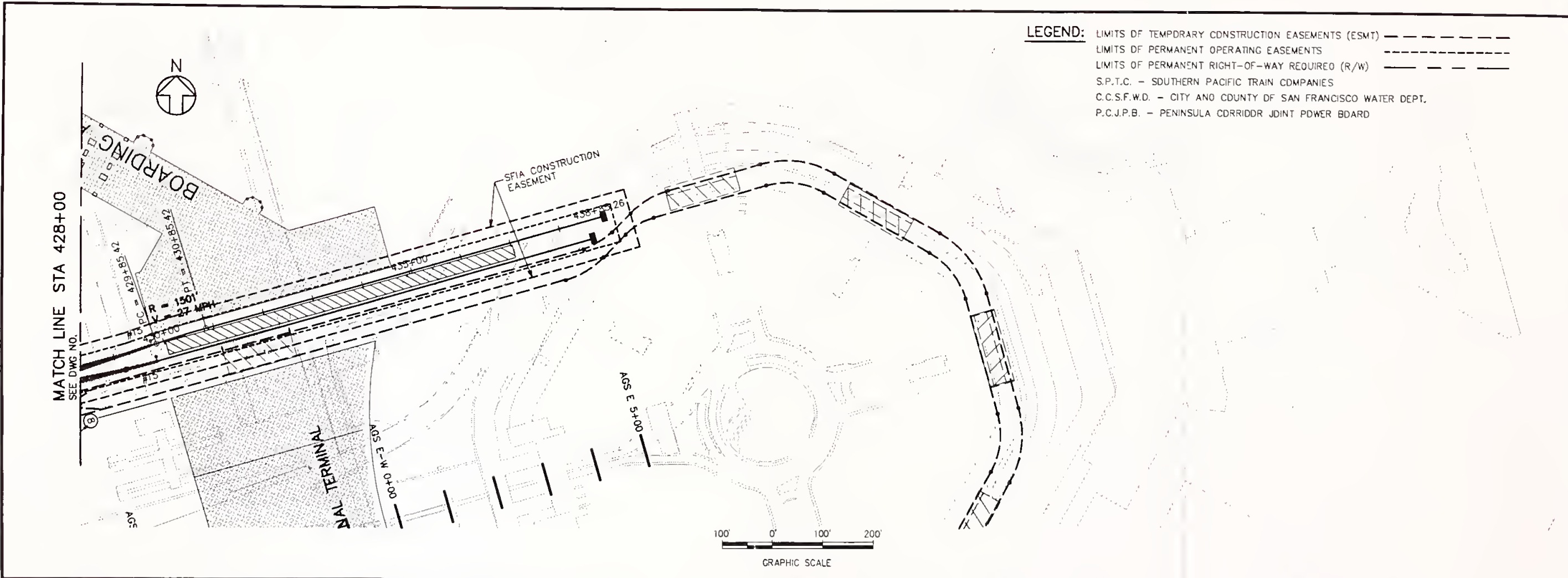
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OAKLAND CA 94604
(510) 874-7300

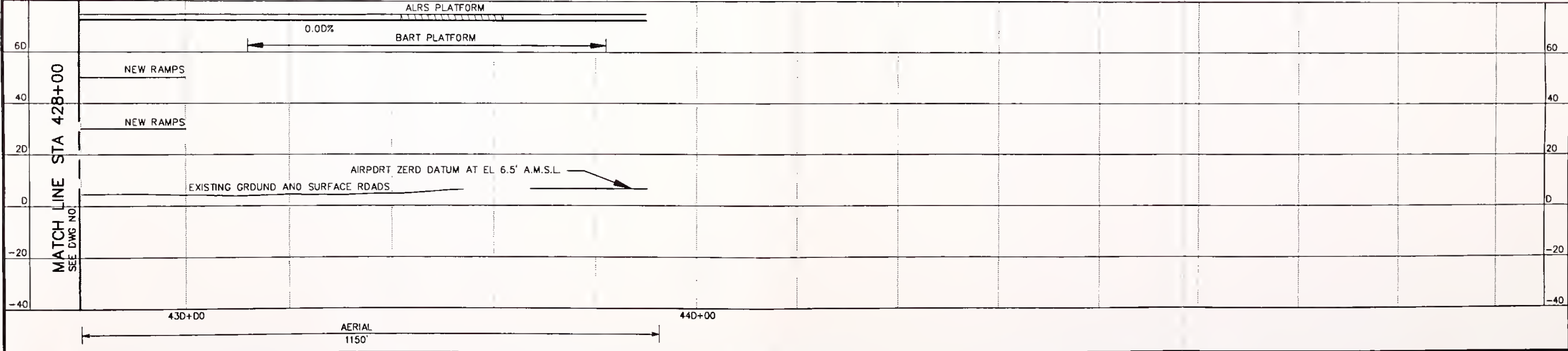
AERIAL DESIGN OPTION B
PLAN AND PROFILE
STA 400+00 TO STA 428+00

1"=100'H
1"=20'V
FIGURE 9
DATE:

CADD FILENAME: MEAC0924 CADD DATE: 14SEP95



- LEGEND:**
- LIMITS OF TEMPDRARY CDNSTRUCTION EASEMENTS (ESMT) - - - - -
 - LIMITS OF PERMANENT OPERATING EASEMENTS - - - - -
 - LIMITS OF PERMANENT RIGHT-OF-WAY REQUIRED (R/W) - - - - -
 - S.P.T.C. - SDUTHERN PACIFIC TRAIN CDMPANIES
 - C.C.S.F.W.D. - CITY AND CDUNTY OF SAN FRANCISCO WATER DEPT.
 - P.C.J.P.B. - PENINSULA CDORIDDR JDINT PDWER BDARD



SAN FRANCISCO AIRPORT EXTENSION
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SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
10DD BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION B
PLAN AND PROFILE
STA 428+00 TO STA 437+00

1"=100'H
1"=20'V

FIGURE 10
DATE:



CADD FILENAME: WEAOC25 CADD DATE: 14SE95

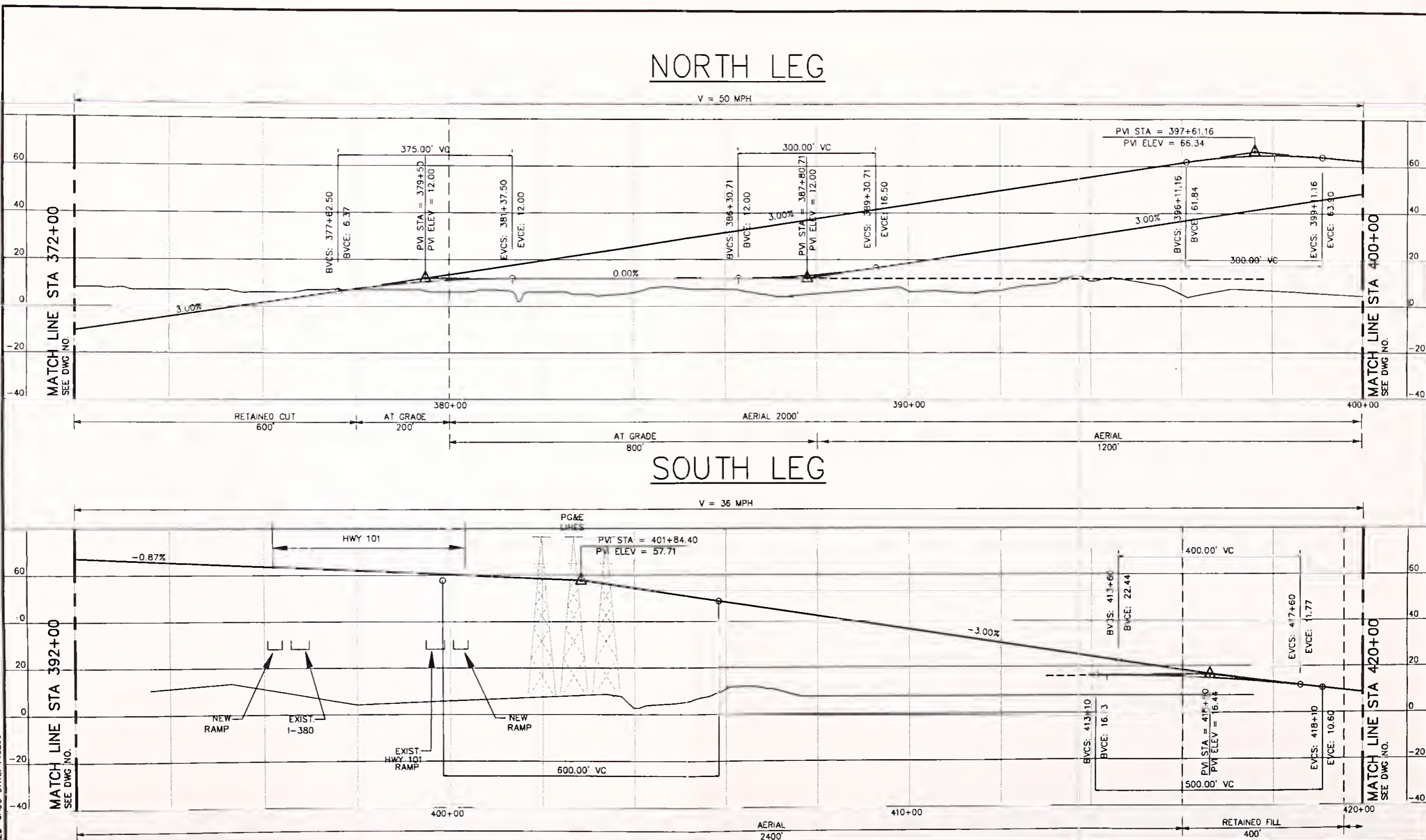


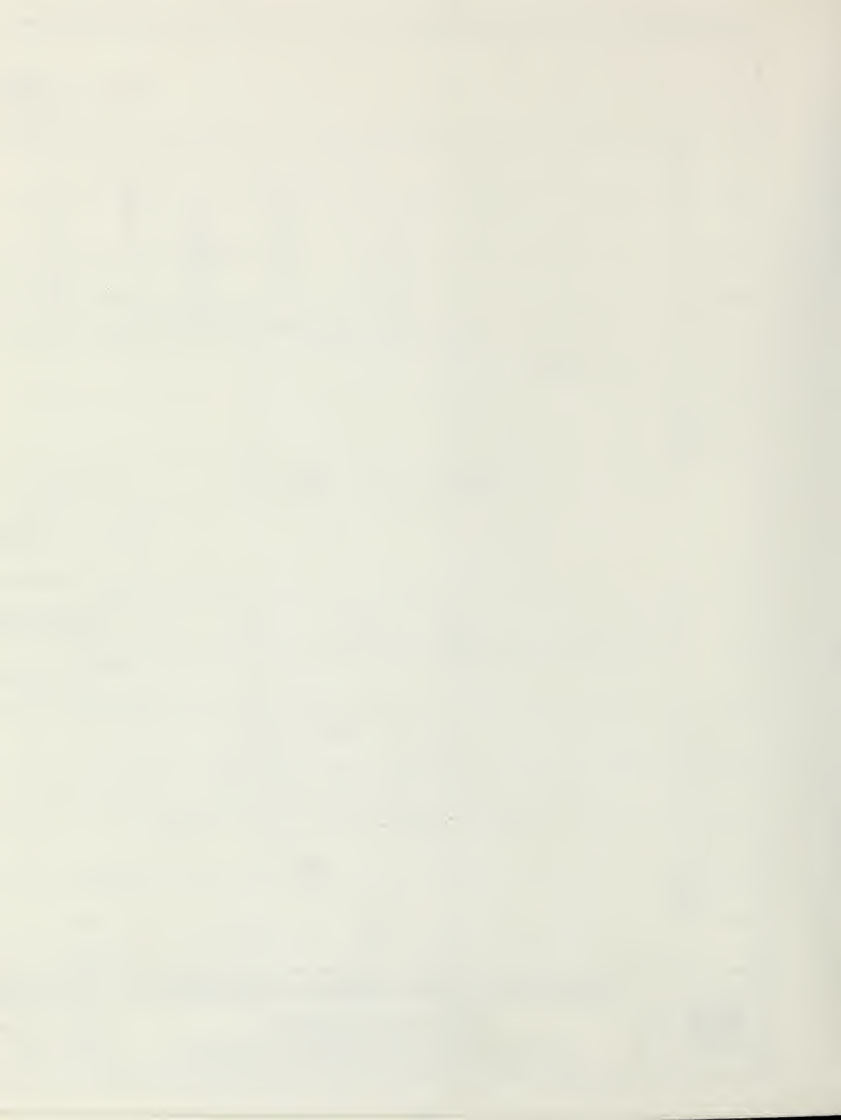
SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

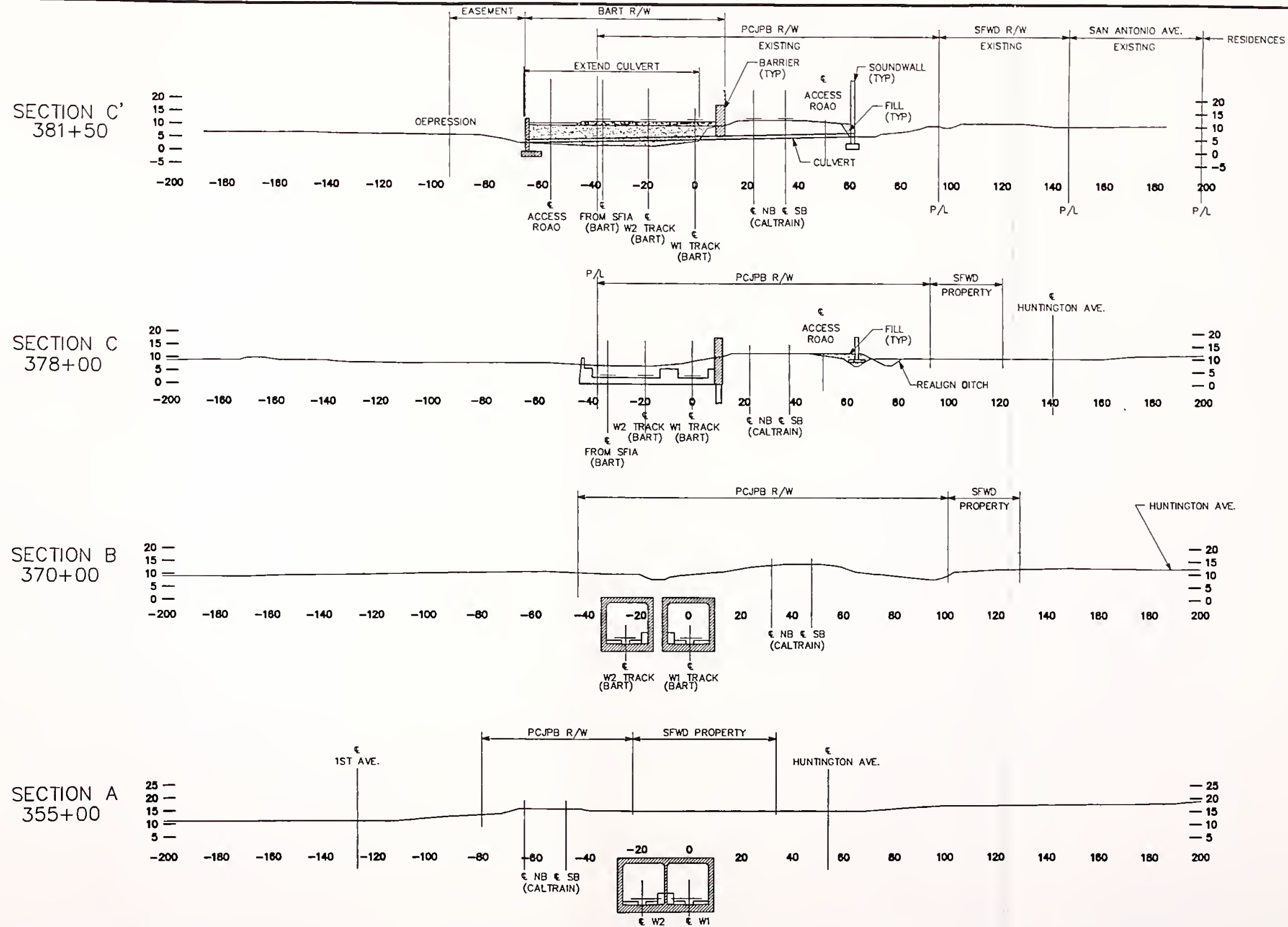
AERIAL DESIGN OPTION B
PROFILE
STA 372+00 TO STA 420+00

FIGURE 11
DATE:





CADD FILENAME: WEAC0951 CADD DATE: 19SE95



SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

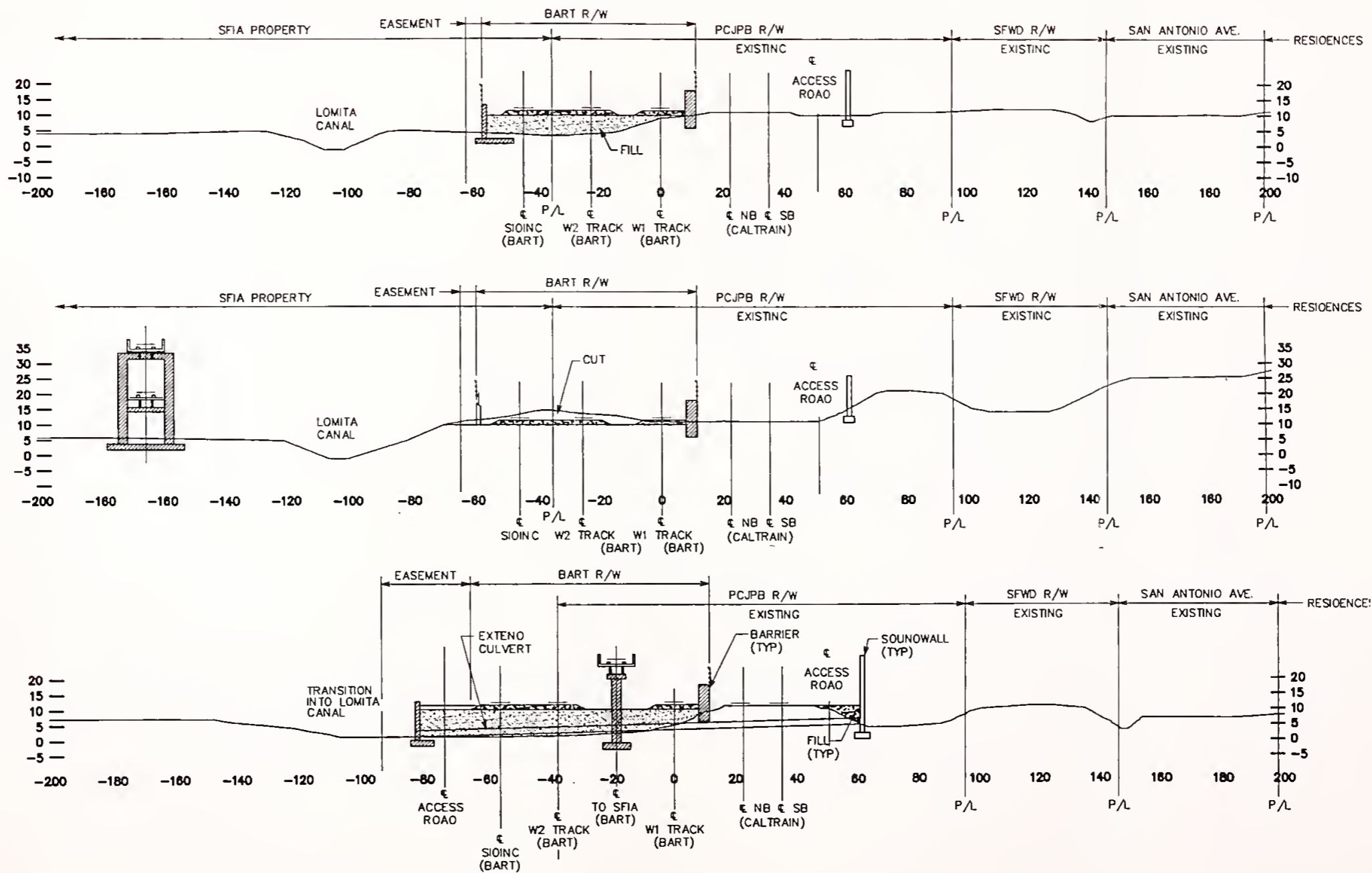
BAY AREA TRANSIT CONSULTANTS
BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B

SECTIONS
SHEET 1 OF 5

1"=100'H
1"=20'V

FIGURE 12
DATE:



CADD FILENAME: WEAOC952 CADD DATE: 19SE95



SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
 SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

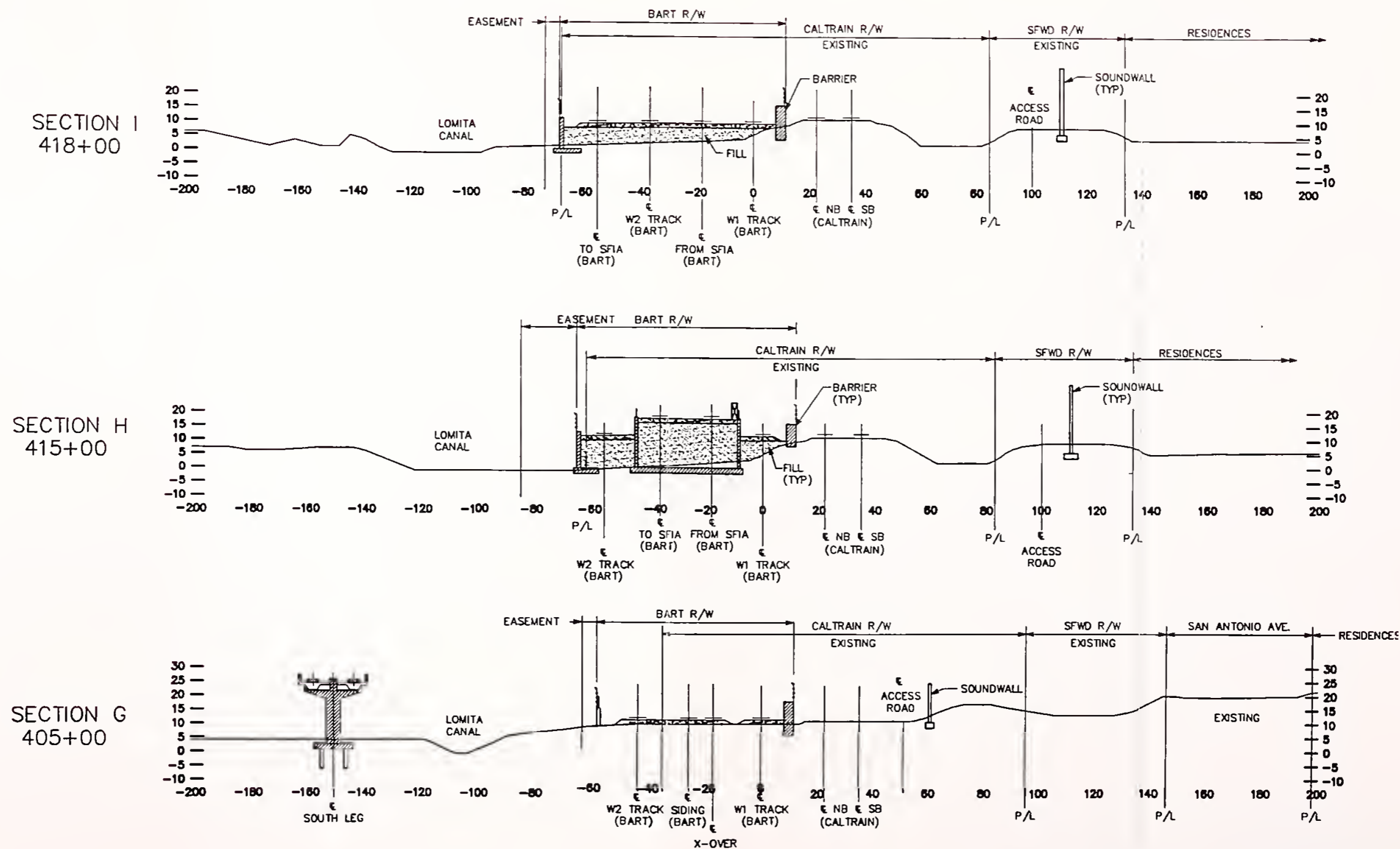
BAY AREA TRANSIT CONSULTANTS
 BECHTEL-PARSONS BRINCKERHOFF-TODD-WARREN
 1000 BROADWAY, 4TH FLOOR
 OAKLAND CA 94604
 (510) 874-7300

AERIAL DESIGN OPTION X OR B
 SECTIONS
 SHEET 2 OF 5

1"=100'H
 1"=20'V

FIGURE 13
 DATE:

CADD FILENAME: WEA00912 CADD DATE: 14SEP95



SAN FRANCISCO AIRPORT EXTENSION
FRDEIR/S#2DEIS
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

BAY AREA TRANSIT CONSULTANTS
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1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B

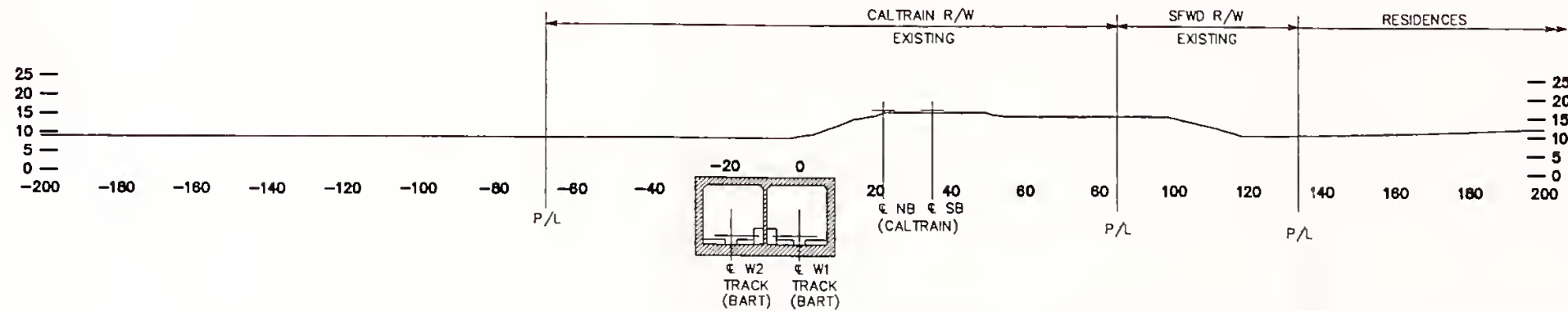
SECTIONS
SHEET 3 OF 5

1"=100'H
1"=20'V

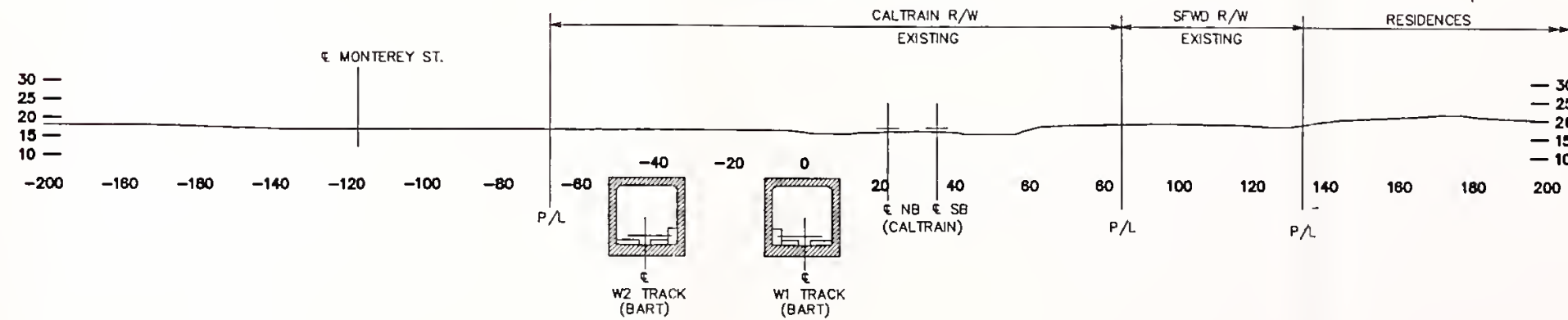
FIGURE 14
DATE:

CADD FILENAME: WEA09-4 CADD DATE: 19SE95

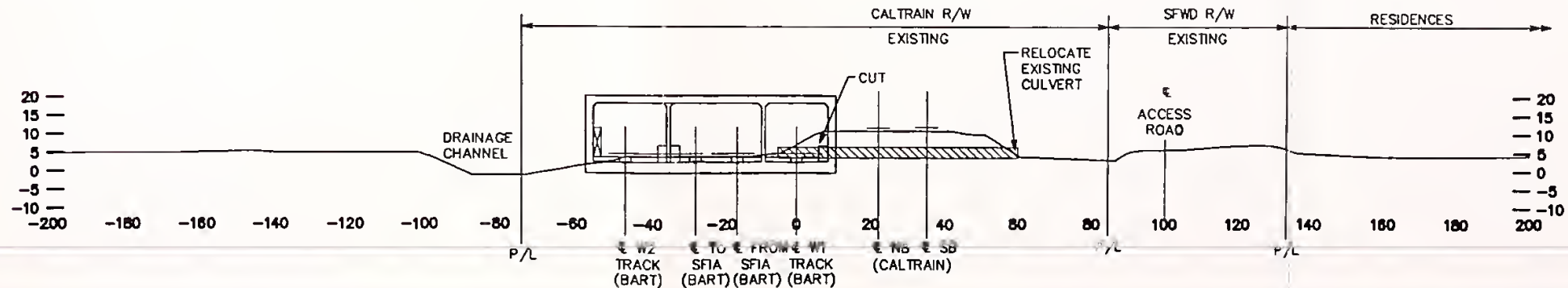
SECTION L
455+00



SECTION K
430+00



SECTION J
420+00



SAN FRANCISCO AIRPORT EXTENSION
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OAKLAND CA 94604
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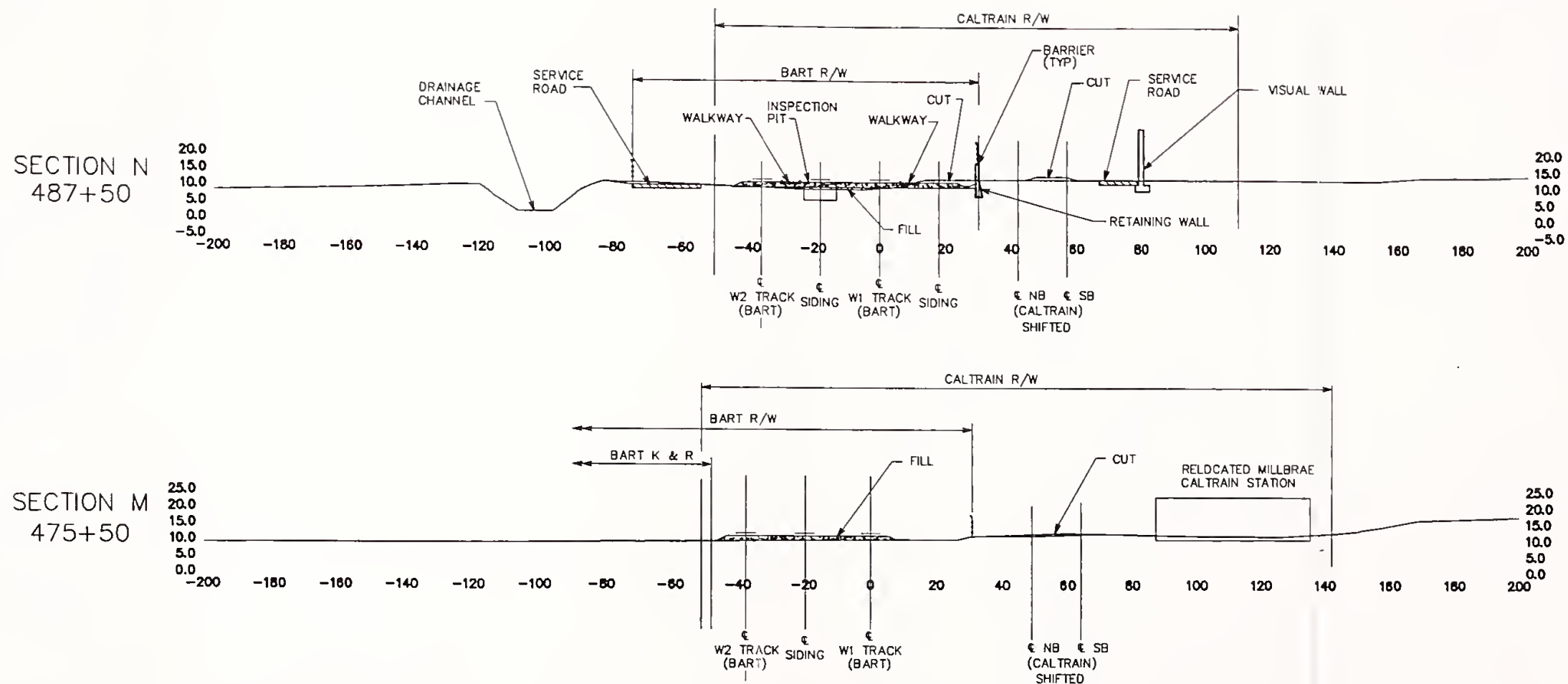
AERIAL DESIGN OPTION X OR B

SECTIONS
SHEET 4 OF 5

1"=100'H
1"=20'V

FIGURE 15
DATE:

CADD FILENAME: WEAC0955 CADD DATE: 199505



SAN FRANCISCO AIRPORT EXTENSION
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1000 BROADWAY, 4TH FLOOR
OAKLAND CA 94604
(510) 874-7300

AERIAL DESIGN OPTION X OR B
SECTIONS
SHEET 5 OF 5

1"=100'H
1"=20'V

FIGURE 16
DATE:

